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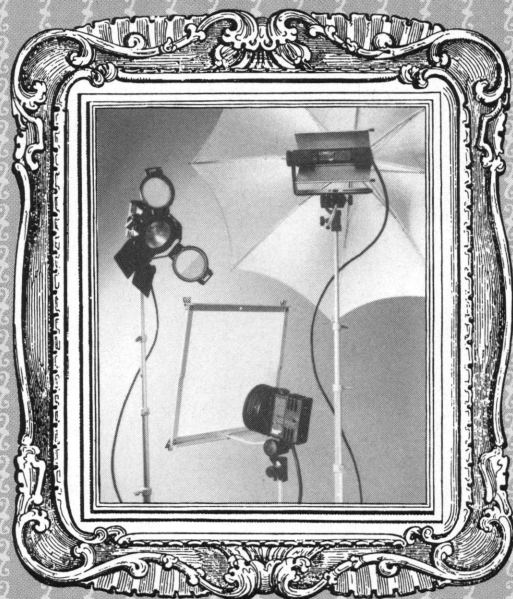
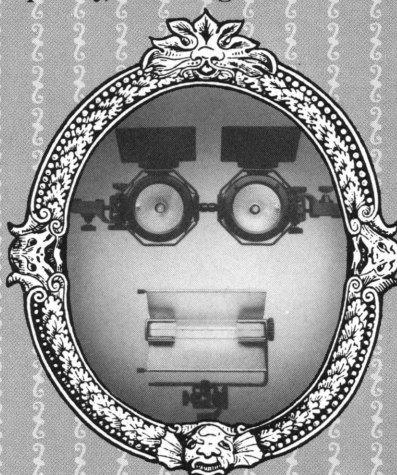
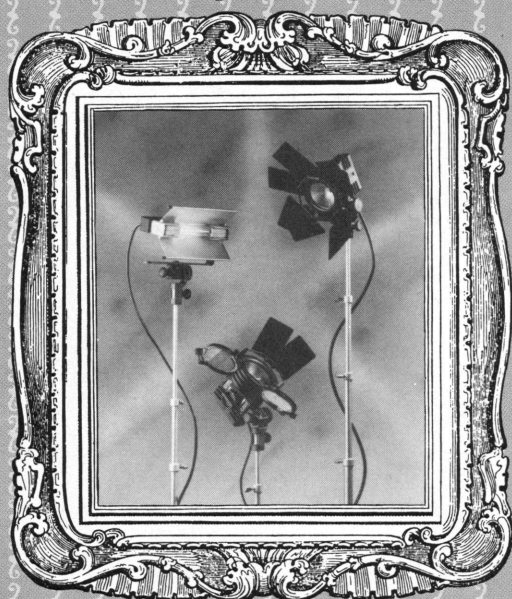
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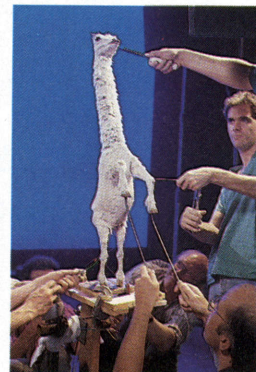
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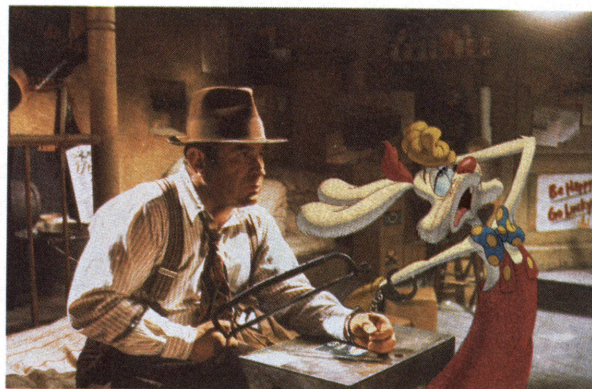
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away handcuffs
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Roger Rabbit. (Film
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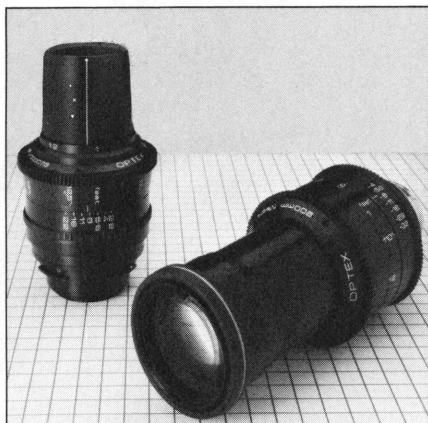
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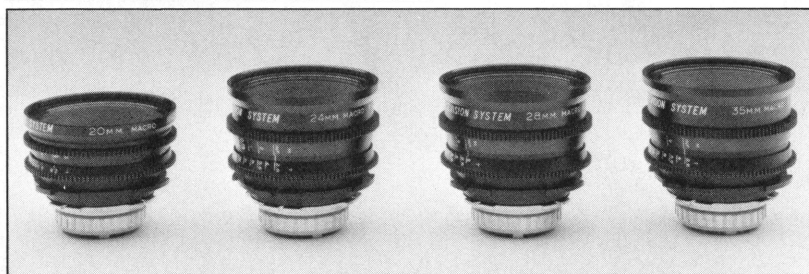
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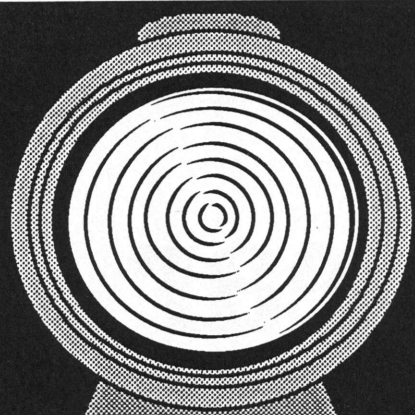
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Letters

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As a professional video operator working in TV commercials and features in England, I am in the process of setting up an association for British video operators and co-ordinators. I would very much like to hear from any of our American colleagues who may be doing the same, or already have such groups.

I have written many letters and would appreciate it if you could help elicit interest in this project.

—Tom Jeffers
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Following our television series, *Unknown Chaplin* and *Buster Keaton – a Hard Act to Follow*, we are embarking on a program about Harold Lloyd.

If any of your readers worked with Lloyd we would be delighted to hear from them. We are particularly anxious to hear from anyone who knew him in the silent days.

Finally, a dilemma from the Keaton program: what happened to Elgin Lessley? Despite the most energetic research by us, and by Al Keller, ASC, we can follow his career no further than 1928 and *The Cameraman*. He was not a member of the ASC, though he was of the Static Club, but any information would be most gratefully received.

—Kevin Brownlow/David Gill
Thames Television
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Voila!

There are so many brilliant French cinematographers, past and present, I hope you will allow me to correct a statement made on page 51 of your April 1988 edition.

Philippe Rousselot is certainly one of the great French directors of photography of today and it therefore came as no surprise that his fine work on *Hope and*

Glory was honored by an Oscar nomination. However, it is not true to say he is only the second Frenchman to be nominated during the 60 year history of the Academy. I think there are at least five others and three of them, together with Ghislain Cloquet, ASC, won Oscars:

Thief of Baghdad, (1940), Georges Perinal, Oscar; *Roman Holiday* (1953), Henri Alekan (with Frank Planer), nomination; *The Longest Day* (1962), Jean Bourgoïn and Walter Wottitz, Oscar; *Is Paris Burning?* (1966), Marcel Grignon, nomination; and Cloquet for *Tess* an Oscar in 1980 along with Geoffrey Unsworth.

—Sydney W. Samuelson
London, England

More on Dracula

Allow me to add to the informative look-back at the 1931 *Dracula* (May, 1988 issue).

The incomplete print of the Spanish language version does not exist at the Museum of Modern Art. It was borrowed from the Library of Congress and screened at MOMA – only once – in August 1977. Audiences were startled to see how cinematic and inventive the director/cameraman team of George Melford and George Robinson was. Their emphasis on camera movement and stage effects made the Browning/Freund English language version pale by comparison! Universal may have felt more comfortable in subjecting a foreign audience to stronger stuff.

For example: In Melford's version, water runs down the crypt steps, and stops when Dracula opens his coffin. Smoke pours out as he rises, with no shy "panning away" as was done with Bela Lugosi. Different takes of vermin are used; we see "new" shots of the rat and the giant bug creeping out of its box. Even the opening glass shot is different.

The miniature Castle Dracula, built for Karl Freund by Universal propmaker William Davidson, is barely visible in Browning's film. Yet here, it is flaunted in profile, in a beautiful composite showing a precipice

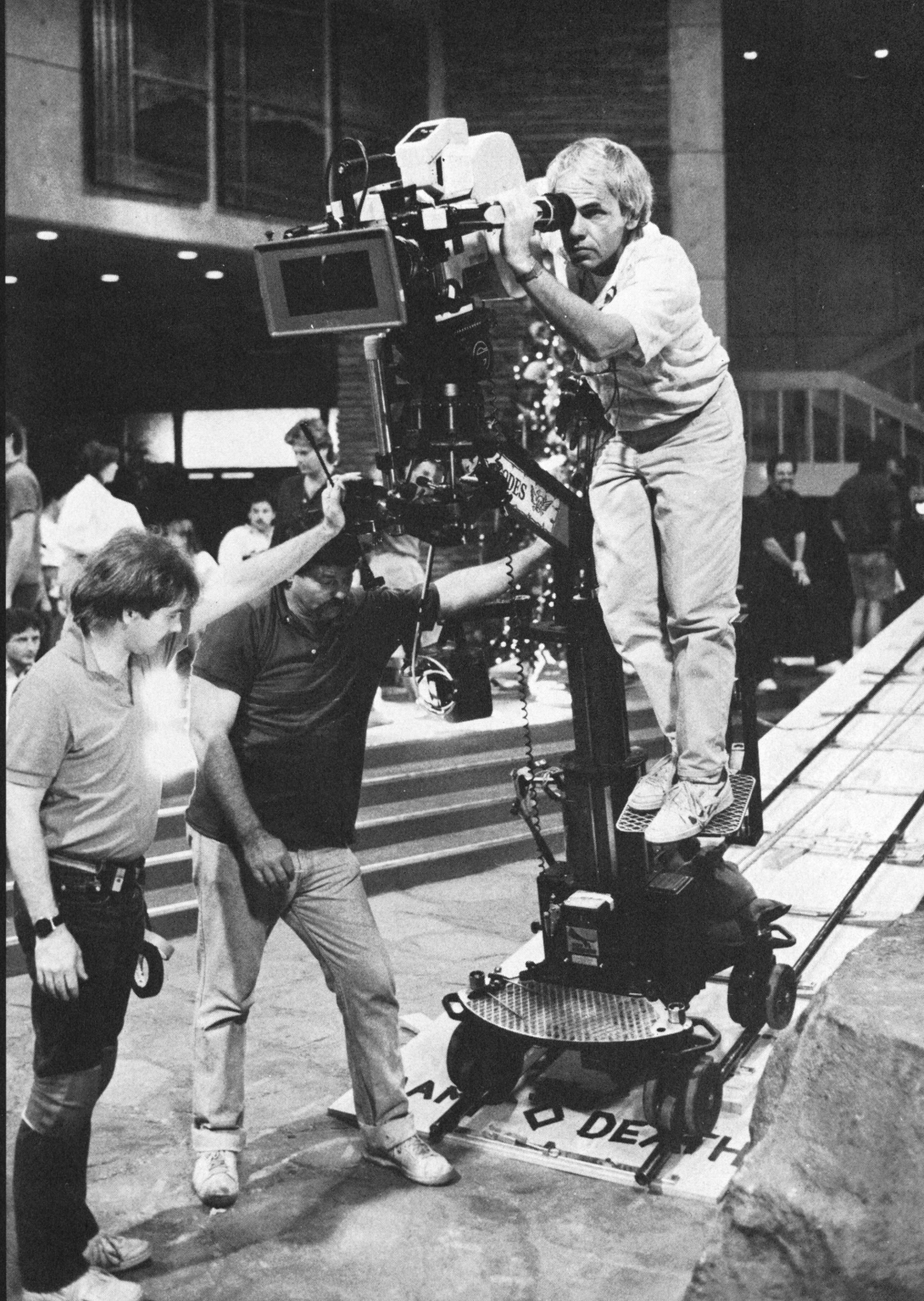


Photo: Peter Sorell

Jan DeBont shooting with FGV PANTHER Dolly and FGV Lightweight Jib on the set of "Die Hard," a 20th Century Fox Feature.

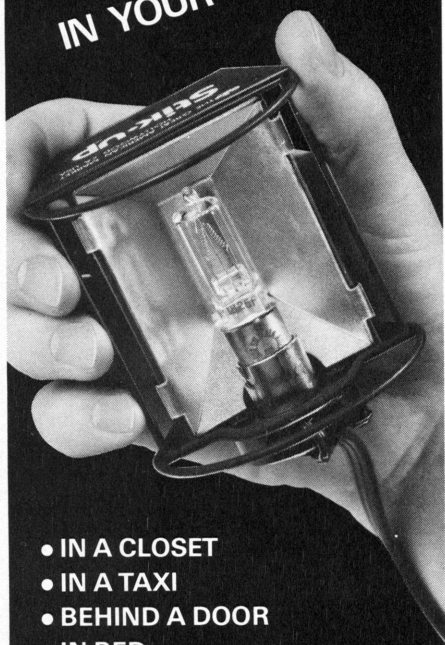
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and water below. (It may have inspired a similar tableau in *White Zombie*.) Renfield's stay at the inn is better developed, as in Murnau's *Nosferatu*. In the castle, he bloodies his finger on a blade, not a mere paper clip.

Though the Spanish dialogue is longer, the pace seems quicker, because more is happening visually. It doesn't languish like the film. Villar's Dracula bares fangs, in contrast to Lugosi's "toothlessness." The ample bosoms of the female leads heave from low-cut peasant dresses. Vampiric Mina (Eva here) laughs seductively as she lunges for Harker's neck; in Browning's film, she moves forward lethargically, and the action is kept off-camera.

Renfield becomes totally maniacal. In Seward's parlor, he catches a fly, sucks it dry, and releases it. A wolf is shown running across the lawn, while we are merely told of this in Browning's film. Villar's reaction to Van Helsing's mirror is predictably hammier than Lugosi's.

The Spanish finale packs more punch. Renfield drops over the staircase midway, plunging to his death. Dracula and the girl walk by the body and the camera shoots down from the rafters; Browning's version of this is hopelessly stagebound. Villar is shown scurrying back into his coffin when shards of sunlight make him gag.

Melford's *Dracula* was shot back-to-back with the American version in 26 days (October 10-November 11, 1930). Whenever Browning & Freund vacated a set, Melford & Robinson stepped in with their buxom brunettes.

Assistant directors on the Spanish *Dracula* were Jay Marchant and Charles Gould. The script girl was Josephina Llor, whose native language undoubtedly helped. The film cutter was Alberto Taveres, in the post normally occupied by Milton Carruth.

Final tab for the Spanish *Dracula*: \$69,336.

A footnote to the restoration of Browning's film. We've all wondered about the *grand guignol* of the uncut ship sequence. Certainly the release print has audible blips, pointing to cuts. If the newly-found lavender protection print conforms to the original negative, the missing scenes on the neg were probably ditched in 1930.

It pays, then, to examine the "Sea Sequence" of the final script concocted in August 1930 by Garrett Ford, Tod Browning and Dudley Murphy. During the storm, the captain lashes himself to the wheel, "a crucifix gripped in his hand, his face contorted by terror." Dracula's fingers creep out from his coffin. Watching this are

two sailors whose "faces fill the entire screen — masks of terror." Dracula peers at them through the window pane "with beset eyes." (This cut survives.) A sailor rears back "in maniacal laughter" and drops into the sea. The captain screams, followed by "superimposed faces of screaming sailors, driven beyond the bounds of human endurance!" Then, with cloak billowing in the gale, Dracula closes in on the captain, "a screaming helpless wretch." Renfield observes this from the window, "a raving maniac, moving like an animal in a cage." Great walls of water blot out everything (that too survives). Dissolve to Wharf.

How tempting it is, to presume that all of this was filmed. Judging from the sound blips, it probably was. Sadly, we'll never know for certain.

—Paul Mandell
New York City

A Heat Wave

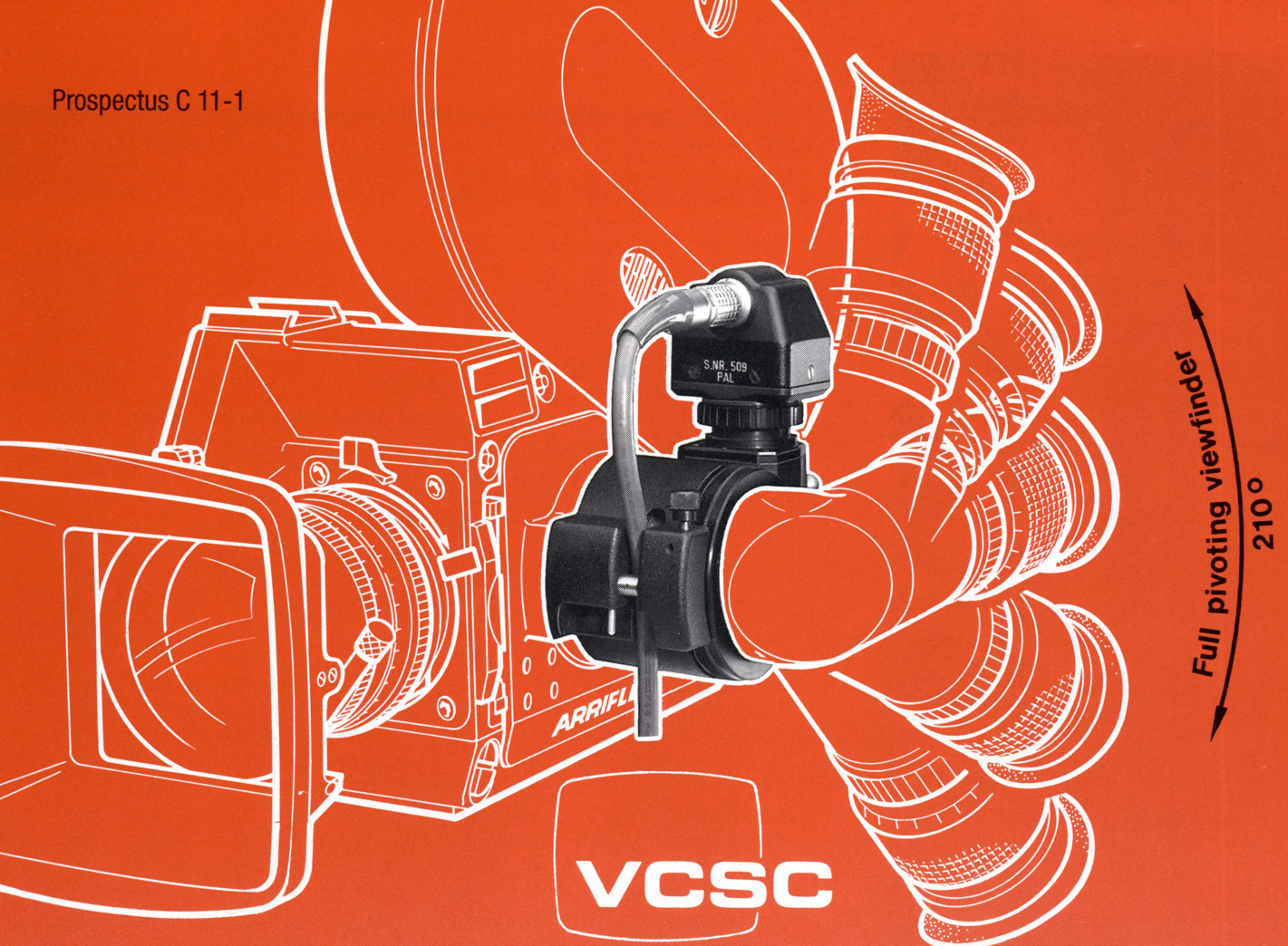
In the article about the visual effects created for the film *Predator* (April, 1988), the author describes the process used to simulate the heat-sensing vision of the creature. One way the crew thought of was to use infrared film, but the author says they rejected this idea because they, "soon discovered that no film can see the wavelengths people emit in a jungle, where the external temperature is so close to that of our bodies. The film couldn't differentiate between the two."

Well, he was correct that they couldn't use infrared film, but his reasons are based on a misconception of what infrared film can do. Arnold Schwarzenegger could be standing in the middle of the Arctic on a cold night in winter and the film still couldn't differentiate between him and the surroundings because until an object reaches about 482°F there is no emission of wavelengths to which the film is sensitive.

Kodak's infrared emulsions are sensitive to infrared radiation which is between 700 and 900 nanometers. An easier way to think of it is that if the film were sensitive to heat produced by bodies it would be very difficult to load the camera. As soon as you got near the film you would fog it. Kodak has a few helpful publications on infrared film and its uses and goes into more detail than I have here.

I know that Arnold is "hot" at the box office, but to do what the author suggests, he would literally burn the box office down.

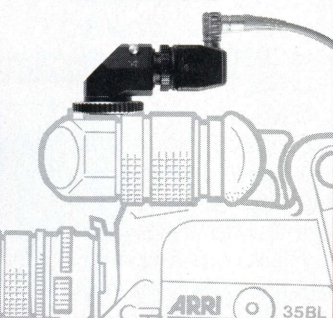
—Peter K. Thomas
Rochester, NY



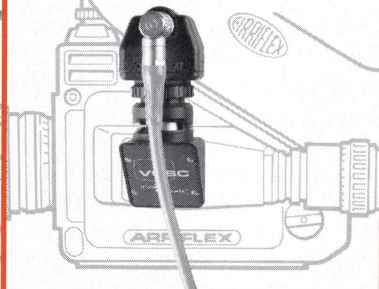
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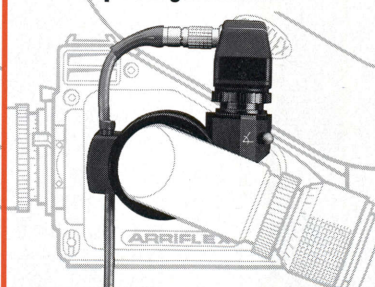
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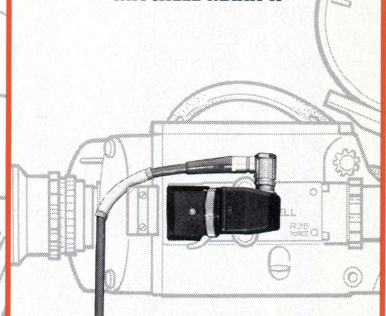
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HOLLYWOOD

The Bookshelf

by George L. George

Grouping some 170 woman-centered World War II films in appropriate categories, *Hollywood's Wartime Women* by Michael Renow traces the relationship between these movies' themes and the social climate of the period. This scholarly study ascribes to Washington the pressures and limits placed on wartime artistic freedom. (*UMI Research, Ann Arbor, MI, \$49.95*).

The mental image induced by a female voice on a film's soundtrack is probed by Kaja Silverman in *The Acoustic Mirror*. It considers the correlation between film theory and feminist psychoanalysis as it examines the manner whereby female voices illuminate a film's underlying sexual themes. (*Indiana U. Press, Bloomington, \$37.50/12.50*).

A comprehensive directory useful to entertainment industry professionals and scholars, *Sourcebook for the Performing Arts* provides convenient access to documentation on film, television, radio and the stage through institutions and individuals. It is a valuable research tool despite conspicuous errors in addresses, obsolete and non-methodical listings, and name misspellings. Compilers are Anthony Slide, Patricia K. & Stephen L. Hanson. (*Greenwood, Westport, CT, \$45*).

Rewriting, rather than writing, is what makes for a salable screenplay: this is the advice that Hollywood script consultant Linda Seger offers in *Making A Good Script Great*. Her skillful analysis of a screenplay's elements uses the script of *Witness* as an example of the effectiveness of the rewriting process. (*Dodd Mead, NYC, \$15.95/8.95*).

The early achievements of Soviet cinema rode on an unprecedented tide of theoretical and polemical writings. A number of these are collected in a comprehensive volume, *The Film Factory*, translated and edited by Richard Taylor and co-edited by Ian Christie. These significant documents of the 1896-1939 period draw an impressive picture of the debates that shaped Soviet cinema as a major cultural force. (*Harvard U. Press, Cambridge, MA, \$49.95*).

The foremost theoretician of film, Soviet director Sergei Eisenstein, left abundant material at his death 40 years ago. A first volume, *Writings 1922-34*, edited and translated by Richard Taylor, offers a definitive version of articles that present the development of Eisenstein's thoughts and theories that vitally affected cinema as an art form. (*Indiana U. Press, Bloomington, \$37.50*).

A major text by Sergei Eisenstein on the philosophical and esthetic basis of cinematography, *Nonindifferent Nature* assembles articles that cast a new light on the director's theoretical concepts. Translated by Herbert Marshall, they broaden Eisenstein's theory of montage into a complex synthesis of literature, drama, the visual arts and music—a theory of culture and art as a whole. (*Cambridge U. Press, NYC, \$37.50*).

In *500 Best British and Foreign Films*, editor Jerry Vermilye synthesizes old classics and recent movies, selected by the National Board of Review and available in cassettes. Production data, credits and interesting background notes are included. (*Morrow/Quill, NYC, \$25/15.95*).

A broad collection of films on videocassette appears in *Roger Ebert's Movie Home Companion* (1988 ed.), compiled by the rotund half of the Siskel & Ebert TV reviewing team. Perceptive assessments, witty comments, plus the usual production data, chronicle the 700 films of this engrossing anthology. (*Andrews McMeel Parker, Kansas City, MO, \$10.95*).

In *American Horror*, editor Gregory A. Waller collects essays on a popular film genre noted for *Rosemary's Baby*, *The Exorcist* and *Halloween*. Significant texts scrutinize horror films' representation of violence, their generally female victims, often gratuitous gore and cultural ambiguity. (*U. of Illinois Press, Champaign, \$34.95/14.50*).

Aspects of the monster movie genre are explored in current books. Patrick Lucania's *Them or Us* focuses on *The Blob* and other alien invasion films of the 50s,

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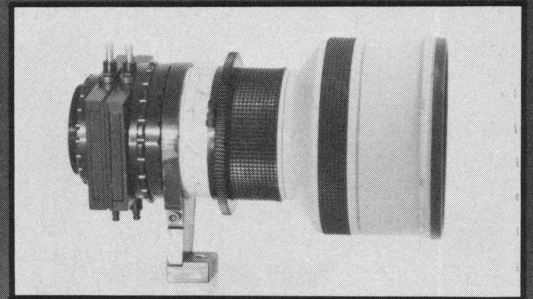
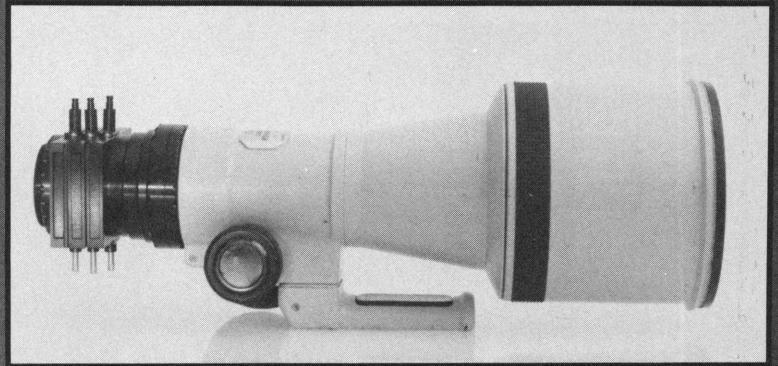
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finding in their "exploitative absurdity" true meaning and symbolic value. In *Beasts and Behemoths*, Roy Kinnard discusses such films as *King Kong* and *Godzilla*, where prehistoric creatures fascinated audiences and helped advance special effects techniques. (*Indiana U. Press, Bloomington, \$27.50/12.50; Scarecrow, Metuchen, NJ, \$22.50*).

The adventurous hero of the Indiana Jones epics is profiled in current biographies. Minty Clinch's *Harrison Ford* explores understandingly his psychological persona, career and private life, while *Harrison Ford* by Ethlie Ann Vare and Mary Toledo paints a breezier account of his rise to fame. (*David & Charles, N. Pomfret, VT, \$24.95; St. Martin's, NYC, \$3.50*).

Confession-like memoirs reveal long-concealed events in two celebrities' private lives. In *Detour: A Hollywood Story*, Lana Turner's daughter Cheryl Crane (with Cliff Jahr) discloses her mother's turbulent amours that led to Cheryl's fatal stabbing of Lana's gangster lover, Johnny Stomponato. In *Keeping Secrets*, Suzanne Somers discloses the ravages of her family's alcoholism and her ordeals in the pursuit of her career. (*Arbor, NYC, \$18.95; Warner, NYC, \$17.95*).

French film scholar Robert Benayoun takes a Gallic look at an American comedian in *The Films of Woody Allen*. This large-format, generously illustrated book searchingly assesses Allen's work, focusing on the cross-cultural references that dot his films and permeate them with a unique intellectual flavor. (*Crown, NYC, \$16.95*).

A challenging quiz book for true Woody Allen believers, Graham Fleshner's *Fun with Woody* undertakes an encyclopedic journey through the comedian's wicked humor in an extensive multiple-choice compilation of one-liners, gags and jokes from his films, plays, books and night club routines. (*Holt, NYC, \$8.95*). △

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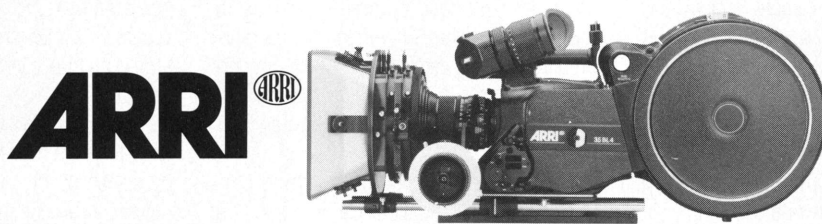


Image Compositing Made Easy

Ultimatte Corporation has announced a new product line, the Ultimatte Memory Head.[®] The Memory Head is a tripod head which makes it possible to shoot blue screen composites with pans, tilts, zooms and focus pulls. Memory Head combines the feel of a fluid head and the stability of a geared head with the repeatability of a motion control system.

The Memory Head is a practical, cost effective means to realism in image compositing on film or tape. It is ideal for both studio and location shooting. The Memory Head is a fully portable system which can be carried by a normal camera crew to the top of a mountain. It is switchable between 120 V 60 Hz and 220 V 50 Hz or can be battery operated.

The Memory Head feels just like a fluid head. The ease with which it moves can be adjusted to suit the operator, and its range can be limited with soft stops to prevent overshooting a set. Each move is recorded on 3 1/2" diskettes so that it can be repeated with absolute precision anywhere, anytime. One diskette will store two minutes of motion information on four axes. Actors on a blue screen stage can be photographed with pans, tilts, zooms and focus pulls. Then a second unit can be sent on location to shoot a background scene with the identical camera moves. Or the background action can be shot first and the camera will repeat the move on the blue screen stage.

A simple switch closure can trigger the entire move, or time code can be used to repeat any portion of a move.

No other camera support system combines such ease of operation with precise repeatability. It is a simple matter to push a button, aim the camera and follow the action as with any normal tripod head. The patented user interface enables the operator to program moves with a tripod handle instead of a keyboard.

Gone are the days of static, locked-off composites or pre-programmed motion control setups which dictated how

actors had to move. The actors can be spontaneous and the camera can respond naturally. Even the most subtle framing adjustments can be reproduced in a background scene shot on a different day with the Memory Head.

The basic Memory Head system consists of two separate, easily portable pieces: A 25-pound head and a 28-pound controller. The head portion is available in two versions: The EFP version for portable broadcast video cameras and a studio version for film cameras and large studio video cameras. The same control box drives either head.

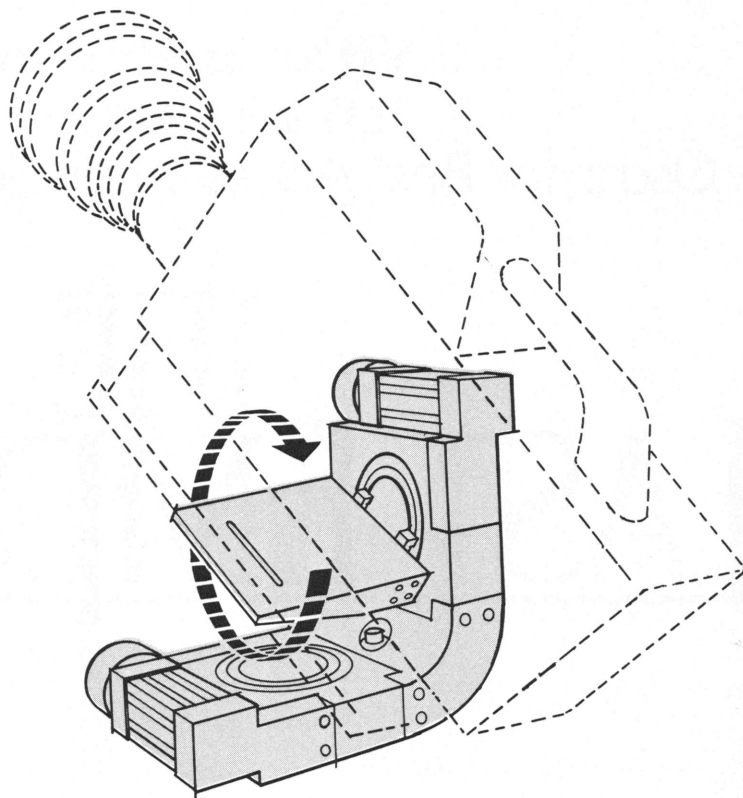
Several controllers can be connected by an IMC net coax cable so that one functions as the master and any number of others are slaved to it. They can be up to 4000 feet apart.

A camera platform with an extended pan arm is available on the studio version as an accessory for setups which require that the nodal point of the lens be positioned at the nodal point of the head. This makes it possible to composite live action with miniature sets using the Memory Head for pans and tilts.

The Memory Head can also be operated by remote control using a special accessory which provides the remote operator with the same type of tripod handle control.

An auxiliary keyboard can be used to edit a move. All the parameters can be scaled up or down; any portion of the move can be compressed or expanded; an entire move can even be pre-programmed.

For more complex applications involving multiple Memory Heads an addi-



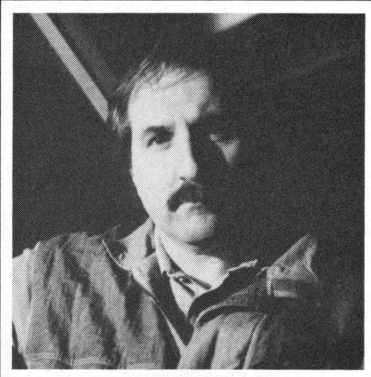
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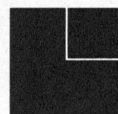
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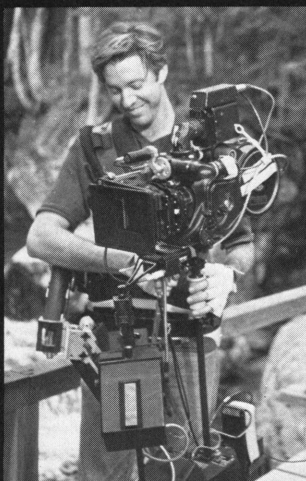
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tional system controller makes it possible to synchronize cameras which are each doing different moves. The same controller makes it possible to drive an IMC slide and transparency compound with a Memory Head. Panning and tilting the camera on a blue screen stage will cause the IMC camera system to execute appropriately scaled moves on a transparency of a background.

For more information contact:
Ultimate Corporation, 18607 Topham
Street, Reseda, CA 91335, (818) 345-5525.

Micro Color Camera

Elmo Mfg. Corp. has announced the availability of a second generation micro CCD color video camera, Model EM-102, which is one of the world's smallest and lightest. The EM-102 features a new CCD image sensor with 300,000 pixels yielding over 360 lines of horizontal resolution. The superb EM-102 optical system, including full iris control, is housed in an amazingly small camera head measuring 0.69" (17.6mm) in diameter and 2.08" (52.9mm) in length. It



Editing System

The latest A/B roll video edit controller from EECO/Convergence, the 900 Plus, now features programmable slow motion for multiple serial VTRs.

The ECS 900 Plus has a 1000 line internal edit list memory and receives time code signals through serial control cables from the VTR's reader boards. Time code can also be cabled separately to the built-in readers of the controller.

The 900 PLUS has full VTR assignment capabilities. Along with switcher control, a full complement of list management features such as add, delete, replace, 409 list clean, block move, list search, scroll, comment entry and sequential/checkerboard auto assembly are included as standard equipment. An optional clean and trace program sorts, optimizes and translates from one format to another.

For more information, EECO, P.O. Box 659, Santa Ana, CA 92702, (714) 835-6000.

weighs less than one ounce and can be installed almost anywhere.

The camera head and control unit are connected by a specifically designed 6.6 ft. cable. Additional cables are available in lengths of 16, 32, 49, 65 and 98 ft. enabling the camera head to be used up to 98 feet from the control unit without any loss of resolution. The electronic high speed shutter is selectable from 1/60 second (normal) to 1/1000 second to freeze rapid action and produce crystal clear still frames and slow motion in playback for careful analysis. The Elmo EM-102 can easily adapt to existing systems or produce its own internal synchronization. The camera is gen-lockable and sync switching is automatic. A new automatic white balance circuit constantly corrects the white balance level to provide optimum color rendition at all times even under varying lighting conditions. The EM-102 also features a noise reduction circuit to vastly improve signal to noise ratio which results in color and signal quality at all light levels.



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For specific data, write CCD Division, Elmo Mfg. Corp., 70 New Hyde Park Road, New Hyde Park, N.Y.



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Cine 60 has introduced a battery maintenance tool used for reconditioning and testing all types and sizes of 12, 13.2, and 14.4 volt Nickel-Cadmium batteries.

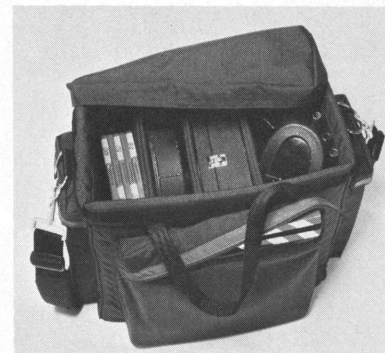
The device, Model DM-1214A Dememorizer, has a switchable 2 amp and 3.5 amp constant current load built-in for discharging a battery; 12, 13.2, and 14.4 volt selectable battery voltage sensors to automatically disconnect the load when full discharge is sensed, and a 4-digit 'run time' clock to register in hours and minutes the duration of the discharge.

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Since actual capacity of a battery is influenced by the discharge load placed upon it, the availability of two discharge rates in the Dememorizer permits greater accuracy in testing how much run time to be expected from the battery. If the battery is to be used for powering low voltage lights, the 3.5 amp current load can be utilized. And if for powering a camera, the 2 amp current load provides a more accurate reference of what discharge time to expect in the field.

For more information: Cine 60, 630 9th Ave., New York, 10036, (212)

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Bag and Box

Huston's Larry bag is now made of 2 oz. urethane coated cordura for positive waterproof protection. The bag has two padded shoulder straps with extra heavy hardware and can be carried backpack-style with the two straps or conventionally with one.

Just released is Huston's oak front box, finely crafted and finished with an oil treatment which hardens the wood and provides excellent sealing and an attractive natural finish. The box is supplied with four dividers which can be placed in any of seven possible positions. An oak pencil organizer, tape measure hanger, and bottom rabot for the slate are also part of the design. A custom made locking mounting bracket is available separately.

For more information: Larry Huston Studio, 40 East 21 Street, New York, New York 10010, (212) 777-7541.

Zoom for One-Inch Cameras

The new R34x29.5ESM zoom is described by Fujinon as being the longest focal length lens for 1-inch cameras. While introduced at the NAB, in Las Vegas, the lens was not shown. The first production model had to be shipped to South Korea where it is being used in the coverage of the summer Olympic games.

Obviously designed for field use, the lens is built to operate in ambient temperatures ranging from -4°F to +122°F. Minimum object distance is 5.7m. At 1X, the focal range is 29.5-1000mm; with the built-in 2X extender deployed, it's 50-2000mm. The maximum F3.5 aperture is constant from 29.5 to 700mm, and is F5.0 at 1000mm. The new 26.5kg lens is available with a built-in test pattern projector.

Although the 34X zoom was not

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ASC
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BARBARA STANWYCK

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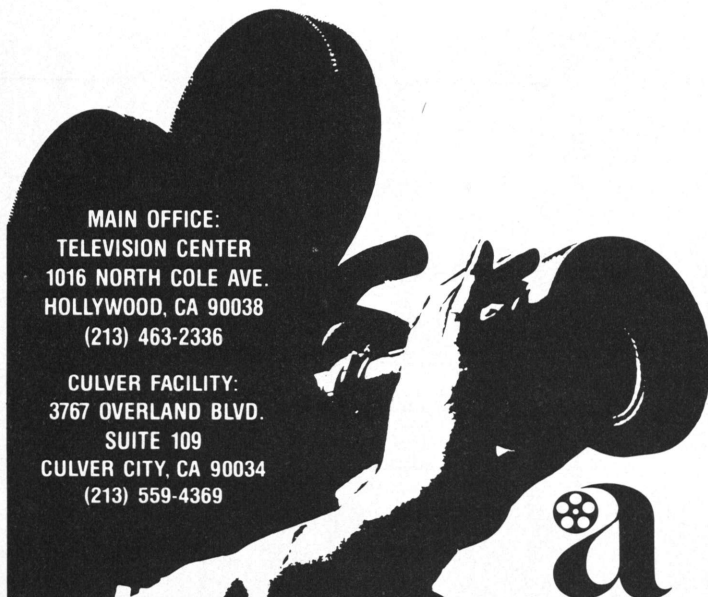
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present, it incorporates all the new features now on Fujinon's large-format lenses. For example, a new built-in LSI microcomputer automatically adjusts the iris to the extender selected and determines the shortest path for the turret. Instead of micro switches, LED sensors confirm turret position and stop servo rotation without jarring or vibration – in 0.6 seconds. With new Fujinon software, lens circuitry and adjustments are said to be drastically reduced.

With the shroud in place, direct access is provided to the back focus adjustment/lock, circuit breakers, tally light switch, and pattern projector level and chart adjustments. LED data displays or viewports report focal length, aperture and if an extender is in position (extenders can be deployed from the lens, remote demand unit or shot box). By limiting the zoom range to match lighting levels for any production, ramping can be avoided completely. Refinements have also been made to result in smoother, quieter and steadier zoom speed control regardless of rate or camera angle.

All major components, such as the power supply and pattern projector, are modular. Motherboard construction makes trouble-shooting and field servicing feasible and practical. Boards plug in and out for instant changes without tools or extension cables. To reduce maintenance, new shielding protects against dust and moisture.

For more information: Fujinon Inc., 10 High Point Drive, Wayne, New Jersey 07470; (201) 633-5600.

Lighting Control

Electronics Diversified, Inc., a manufacturer of performance and architectural lighting control equipment, introduces the Omega™ lighting control console.

Designed specifically for the theatre and television industry, the Omega provides 72 channels, controlling up to 960 dimmers, with 900 full size cues, proportional soft patch with programmable non-dims, and ten individual dimmer curves assignable to any dimmer.

This manual or memory console also features auto linking and multiple step cues, two simultaneous operating special effects, and 72 overlapping pile-on submasters with individual timers. A 3 1/2" disk drive is included for library storage of recorded information and a 13" graphics quality color CRT for displaying constantly updated information and labels for the function keys. The console supports AMX-192, DMX-512, Col-

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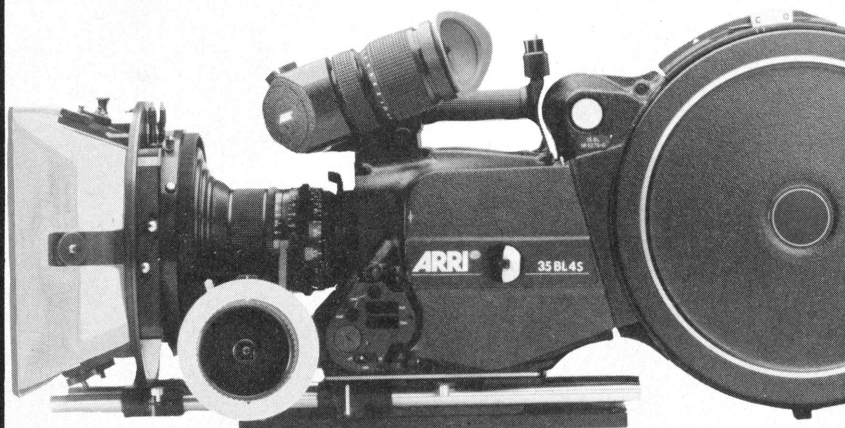
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(Frames from *Serpent & the Rainbow*)

The Serpent and the Rainbow: a Voodoo Tale

by Ron Magid

Special effects are a curse visited on the horror movies of the eighties. They've opened up unlimited landscapes, yet often limited the abilities of filmmakers to tell their tales of terror with subtlety and imagination. Surprisingly, Wes Craven's *The Serpent And The Rainbow* deals with the over-exploited themes of Haitian voodoo and zombies in a semi-documentary style, only resorting to special effects in the climactic battle between the hero and a nasty voodoo priest. Craven wisely recognized early on the importance of attaching a unique special effects crew who

could design spectacular visuals that would still maintain the subtle tone of the rest of the movie. He made the unlikeliest choice of all: Gary Gutierrez and San Francisco-based Colossal Pictures.

Colossal Pictures' reputation rests on the "live" aviation effects they created for *Top Gun* and *The Right Stuff*, as well as the wild and woolly joyride that kicked off the chase in *The Running Man*. "What got most of the attention on films like *Top Gun* and *The Right Stuff* seems to me the more crazy kinds of things we did," says Gutierrez, "catapulting models and

flying them on wires. No one realizes that some of the missiles in *Top Gun* were actually animated and that *The Right Stuff* had a great deal of computer motion control. On the other hand, *The Running Man* rocket sled sequences were done basically in-camera."

Despite the fact that Gutierrez was creating effects that were to be composited optically into a scene for *The Serpent And The Rainbow*, his approach remained spontaneous as he and his crew developed unusual methods of making ethereal effects practically on stage. Gutierrez began experi-

menting to create an illusion never seen before, the phenomenon of the spirits inhabiting the Canari, vessels containing objects belonging to an individual in which his spirit has been captured.

"The director wanted to show the spirits appearing in the atmosphere and then coalescing into a single force to destroy the evil voodoo priest, played by Zeke Mokele," Gutierrez explains. "Though they wanted a kind of spectral effect, they didn't want it to look like anything that had been done before. They didn't want it to look like effects animation of ghosts, instead, they asked us to come up with something that seemed organic and naturalistic."

Gutierrez's solution to the paradoxical desires of the director and producers was based on a technique he had developed for the opening credits of the new *Twilight Zone* television series, where an ephemeral image of Rod Serling appears momentarily, then dissipates into thin air. To create that effect, Serling's image was projected into a cloud of nitrogen vapor. For *The Serpent And The Rainbow*, which required a broader array of effects, elements were created by projecting images into such disparate environments as nitrogen gas, CO₂, water vapor and talcum powder. "It's very much like rear projecting an image onto a screen," Gutierrez points out. "A screen acts as a focal point to capture the image, which you can see from the other side. Nitrogen acts as a screen, but it's an ephemeral kind of event that exists in the air for a short time, then dissipates, so when an image is projected into it, the image seems to float in midair and then disappears. The image can also be made to appear to exist in several planes, depending on how we decide to control the gaseous environment. When we wanted the image of one of the spirits to appear to loom out of its Canari and travel towards camera, for example, we used a fan to create a controlled airstream between the projector and the camera, then wafted nitrogen gas in its path so it would drift

through the air, carrying the projected image with it."

To create the original photography of the elements to be projected into the gaseous environments, Gutierrez organized a one day shoot in a Los Angeles soundstage with three of the film's actors and a trained leopard. The leopard was to represent the soul of the hero, whose *anima* or animal spirit was to leap out of him at a critical moment. "We shot the actors and the leopard against a black background, lit from specific angles," Gutierrez recalls. "Select tapes be-

came plate elements. We had multiple prints made of each, and projected them into clouds of liquid nitrogen and CO₂."

In rephotographing the images in the gaseous environment, Gutierrez had to take special care to insure that the angle of his camera would match to the background plate. "For example, we had one scene in which one of the Canari bottles is thrown to the ground and broken," he says, "and the spirit had to appear to loom up from the ground and flow past camera. In order to line our camera



Opposite page: Jaguar spirit enters Dennis. Left: Spirit is released from canari. Below: Released spirits surround Peytraud.



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angle up so it would perfectly match the background plate with the broken bottle in it, we placed a film clip of that background plate in the gate of our camera and matched to that."

Once the spirits are free of their Canaris, they coalesce out of the air into a single ball of energy which then attacks the evil voodoo priest. "We created that effect by filming an explosion of magnesium on the ceiling of our stage at high speed," Gutierrez says. "The camera was on the floor looking up at a black ceiling, shooting at 120 frames per second. The explosion sent lots of fine bits of magnesium flying through the air like twinkling little stars. We took that footage and reversed it, so these twinkling little fairies seemed to coalesce out of the blackness and rush towards this explosive event. This element became the thing that Zeke Mokele was reacting to and which seems to chase after him before it condenses and penetrates into his body."

Since Gutierrez conceived the regrouping and attack of the Canari spirits as an implosion, he wanted the death of the voodoo priest to occur as an explosion. "First, an element was shot in the Dominican Republic of Zeke Mokele twitching as if he's being attacked," Gutierrez remembers. "We rotoscoped every frame of that element, creating matching animation of the skeleton inside him. That animation element of his

bones, a black silhouette on clear film, was projected through orange gel into clouds of liquid nitrogen that moved up through the frame the way flame would, which made the skeleton appear to be on fire. We superimposed that element over the background plate of the villain twitching, so the complete effect looks as if these spirits have coalesced out of the air and entered his body, which then explodes revealing a flaming skeleton as he drops to the ground in flames. It was very effective."

By far the most complex effect of all was that of 'the rainbow,' the ultimate moment when the villain's death results in the release of the rest of the prisoners from their Canaris. "The effect occurs over a background plate of the room, which was supervised on location by our effects director of photography, Rich Fichter," Gutierrez says. "We needed to create the illusion of dozens of little spectral spirits being released, an effect we achieved back here on our stages in post-production. Using a quartz slide projector as a light beam source, we projected its light into a prism so that it refracted and sent a beam of spectral light into a black tent.

"In this black plastic room, we tried a number of different media to make the beam show up better, including water vapor, liquid nitrogen, CO₂ and talcum powder. Each of these created very interesting, distinct kinds of ef-

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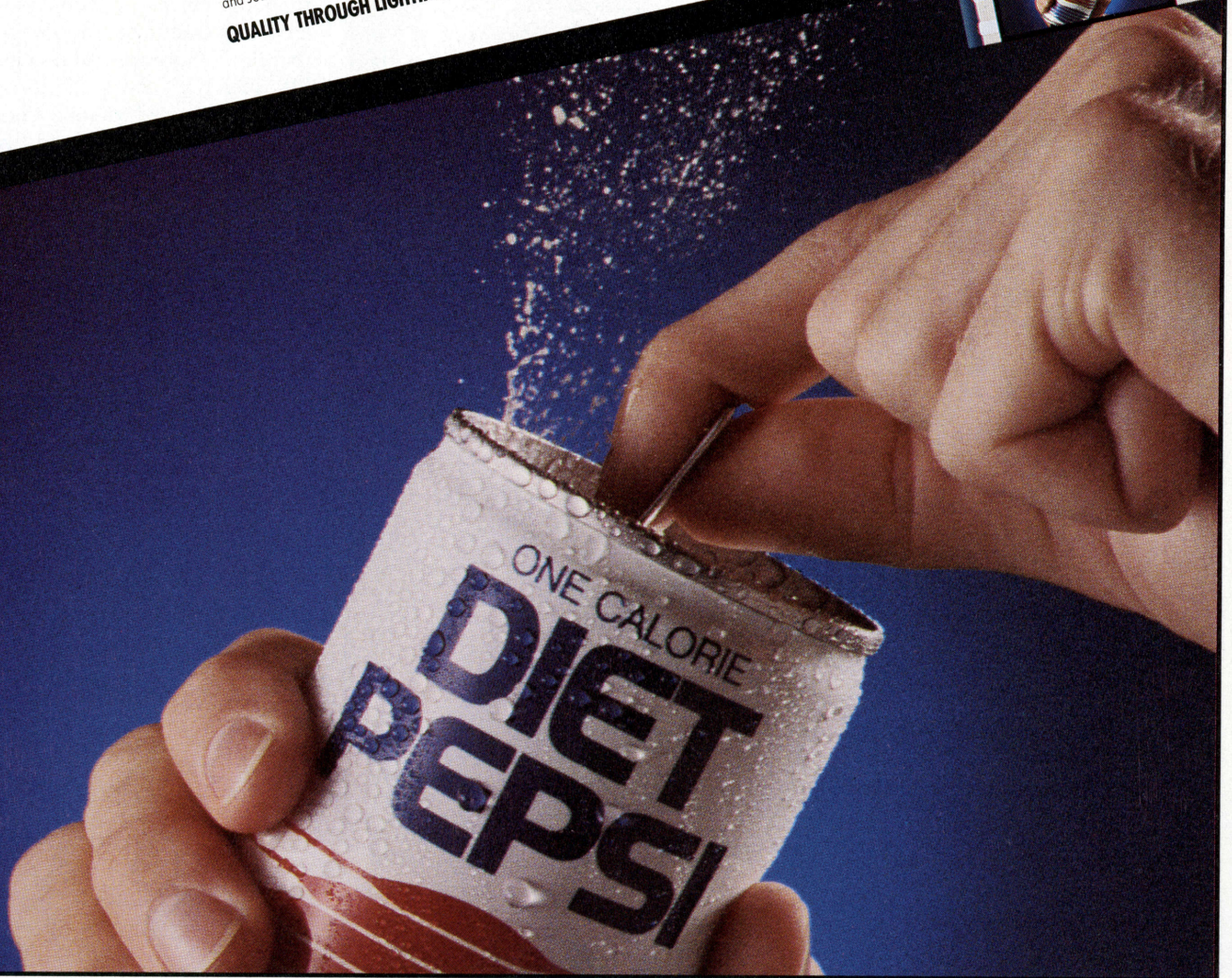
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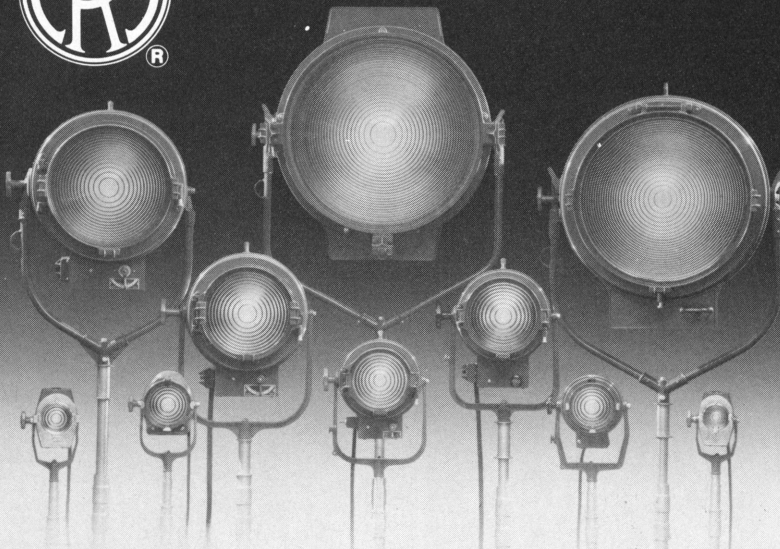
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fects, especially when run in reverse, where they took on a life of their own, seeming to defy gravity. We created over 1200 feet of these non-specific bursts of spectral light appearing in the air, but the ones we liked best were those shot using talcum powder and water vapor, since these environments produced the most veil-like and subtle colorations.

"Next, we made a rotoscope of our locked off background plate in order to divide the room into foreground, middleground and background planes. We used these as optical elements to hold out each of the planes. We then took these ephemeral elements and placed them in each plane so they would appear to overlap each other."

Compositing these opticals was no easy task, so Gutierrez chose a Los Angeles-based company, Illusion Arts. "I knew it was going to require something more than the average optical house to creatively integrate our footage into the film," Gutierrez acknowledges. "It wasn't a very straightforward job—it required density mattes, knowledgeable advice and finesse. The man who actually supervised our optical work was Mark Freund, working in collaboration with Bill Taylor for Illusion Arts. Stuart Cudlitz was the coordinator for Colossal."

After several preview screenings, Craven decided to reconceive the film's ending, deleting some of the effects. "The cuts were in the direction Wes and I wanted to go all along," Gutierrez states. "We felt we had a fairly naturalistic picture and we didn't want it to suddenly turn into an effects blowout. We wanted to do something subtle that wouldn't violate the tone of the rest of the movie." △

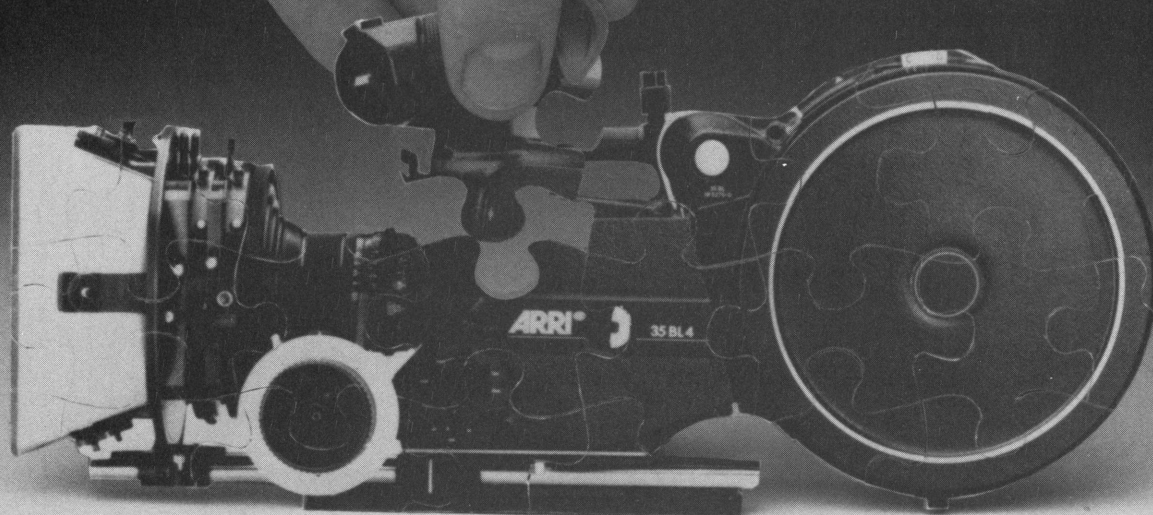


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Illusory Flood Formed for *Housekeeping*

by David G. Stump

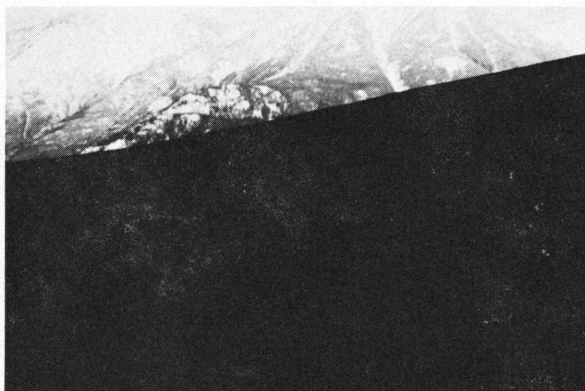
Housekeeping takes place in a small, geographically isolated town in Idaho, where annual floods are a fact of life. It is the bittersweet story of two sisters who grow apart as they grow up. The film was written and directed by Bill Forsythe (*Gregory's Girl*, *Local Hero*), and was adapted from a novel by Marilynne Robinson. The tone of the film is warm, nostalgic and very touching. Producer Bob Colesberry's desire to create visual effects without disrupting this very human feeling led him to Introvision.

The Introvision System is a dual screen process that enables the film maker to create a plate,

either a VistaVision motion picture or a 4 x 5 still, and then create within that plate a foreground, a midground and a background. Actors can then seem to work inside those areas, and actually pass behind and in front of objects in the plates. With the unique side screen, the system can create shots of enormous scope and size using minimal stage space and lighting. The system can be used to create scenes of jeopardy and danger (such as the train scene from "Stand By Me") with no risk to the actors whatsoever. The system has made possible some of the finest double image photography ever done, and unlike

other systems, it works just as well for daylight shots as it does in low key situations. The taking camera is free to pan, tilt and zoom. We used the system in some new and unusual ways for *Housekeeping*, and the results are innovative and striking visual effects.

I was on location in Vancouver, British Columbia when I was first presented with the script for Columbia Pictures' *Housekeeping*. Introvision's Visual Effects art director Tim Donahue arrived with a suitcase, a script, and two tickets to Castlegar B.C. He explained that we had been contacted by Colesberry to meet Forsythe and discuss



Some steps in the making of the Introvision process shot shown on facing page. Top left: The original VistaVision plate photographed on location in Canada. Top right: Painting has been completed and upper portion matted out. Lower left: New upper part original with highlight in area of bridge. Lower right: New upper part with lower part matted out.

some areas in which visual effects might help the film. Colesberry had previously worked with Introvision on MGM's *Reckless*, and was very happy with the cliff hanger that the system had created for that film.

After our arrival in Nelson, the neighboring town in which the film was being made, we met with Colesberry, Bill Forsythe and director of photography Mike Coulter. Forsythe quickly laid out the number and scope of the problems he wanted us to address. There were two main areas in which he felt the picture needed visual effects, both of them important story points. The first area involved the annual flood waters rising higher than usual and flooding the house where the main characters live. The other important area involved a railroad bridge across a lake, spanning roughly two miles of open water. Forsythe felt that the bridge was very important in establishing the isolated geography of the town and its surroundings. There were a number of key scenes that hinged on the bridge, including a flashback to

90 years earlier, when a train had fallen from the bridge and slipped into the frozen lake "like a weasel off a wet rock." In addition to showing the flood, the bridge, and the train falling into the lake, Forsythe wanted to widen the lake and change the mountains on the far shore.

After testing our techniques, we brought to Nelson numerous ideas and proposed several combinations of shots for each scene. Over the course of the next two weeks the final storyboards and arrangements were made to shoot three of the four proposed scenes.

The shots involving the flood were accomplished by replacing portions of a VistaVision frame with water shots photographed in a tank on our stage in L.A. The scene involving the train bridge was shot as a VistaVision plate to be used for a matte painting composite. The winter bridge scene with the train crash remained in question, as there were on-again-off-again plans to shoot the scenes live, later that winter, farther north.

After extensive scouting,

planning and preparation, we began by shooting the locations for later Introvision use. The town square was photographed both in VistaVision and with a 4 x 5 camera. The 4 x 5 plates were shot on very fine grained negative stock, and used to create the missing elements in the scenes. I knew that the standard Introvision technique of shooting in VistaVision for the plate work would enable me to re-photograph these locations onto 4 perf with very high quality. The VistaVision aspect ratio of approximately 1.5 to 1 was very close to the 1:85 aspect ratio of the picture, and the 8 perf negative area would allow another film generation on the effects shots and still match the grain quality of the principal photography.

Because all of the scenes were to be done in full daylight, it was apparent that flashing the negative would be necessary to hold down the contrast buildup in rephotographing the VistaVision plates. Since the Canadian lab being used for the first unit photography had no experience with flashing, we brought the film back to Los Angeles for flash testing and



Above: A finished flood scene from *Housekeeping*.
Right: VistaVision location plate showing the original setting.



development. This meant having to shoot separate 'hero' takes for each percentage of flashing to be tested, so I planned to notch each take after it was shot, and sort out the takes in the darkroom at the studio before sending the film to the lab.

The area chosen for the town square flood scene was a crossroads several blocks outside of the actual center of Nelson, directly in front of the Nelson Police Department. There was no possibility of

creating any sort of real flood in this case, so it had to be visual effects or nothing. Production designer Adrienne Atkinson had prepped the flood scene sites by using a surveyor's level to mark a theoretical flood level. Tape marks were set on buildings, trees, streets, cars, parking meters – all objects that would break the "water level". The streets were dressed with debris at the "shoreline," and extras were placed in strategic areas in the scene.

There were even two men unloading clothing and furnishings from the second story window of a house into a rowboat set atop two sawhorses.

Next we moved to the house location. It was a beautifully authentic three-sided set, constructed in a wooded country area outside Nelson, about half a mile from the actual lake location. It had been built with no provision for flooding the exterior, because Forsythe had originally planned to play all the flood scenes involving the little girl actors as interiors. The interior set was already under construction in a nearby plywood factory that served as a stage. A special tank system built under the interior allowed two feet of water to be flooded into or drained out of the set. However, as the film evolved, it became apparent that an establishing shot of the exterior was needed. The location set was on a slight slope in real terrain, and building a flood tank around it would have been, at best, very expensive and extremely risky. We again photographed the location first in VistaVision, then with a 4 x 5" still camera. Both shots were made from the same camera placement, very close to the theoretical "water level" and with equivalent focal length lenses for the two formats.

The next day we worked with the main unit to photograph a scene at the train bridge. On a section of lake that was about a quarter of a mile across, the production had constructed a 200 foot section of railroad trestle for practical shooting. It had been decided in pre-production that the bridge scenes would be handled as matte paintings. Forsythe had explained that, in spite of his aversion to optical effects, he felt there was no other way to handle these scenes. Here we shot only in VistaVision, as this was a plate to a matte painting. We framed the shot keeping the grandmother and the two little girls against the real lake and the practical train bridge set.

Forsythe had decided that the far shore at the bridge location was not far enough away to paint in

a bridge that would appear to be two miles long. He also felt that the mountains at the other side of the lake were not majestic or rugged enough to tell the story that was in the script. Several hours drive from Nelson, we found a lakeside location near Cootenay Bay that afforded a majestic mountain view across a four mile expanse of lake. We made some quick calculations using the VistaVision lens tables in the first edition ASC manual, and decided on a longer focal length lens than the one we had used for the train bridge plate. This would foreshorten the apparent distance across the lake to two miles in keeping with the director's wishes.

Also, shop supervisors Tony Doublin and Issy Shabtay had begun construction on a water reflection tank. The tank was made eight feet wide at the camera end, 20 feet wide at the back and 20 feet front to back. It was built four inches deep and double lined with black visqueen for waterproofing. Its height of four feet enabled both the camera and the projector to work close to the surface of the water.

By the time the stage was ready for the production of the flood scenes, Chris and I had conducted a number of motion control tests using the Lynx Robotics motion control system. Paul Johnson and Al Miller were most helpful giving advice and encouragement, and we were finally able to run a Mitchell Mark II at 84 frames per second using their system. Tests on our specially constructed water tank told us that 72 fps was the magic speed for the scale in which we were working and we began to set up the flooded house scene.

Tim and I felt that several factors would sell realism in the flood scenes. The water would have to follow the correct perspective, it would have to have the correct scale and wave action, the actual scene would have to be correctly reflected on the surface, and the water would have to be colored and dressed carefully and convincingly.

We began setting up the house flood scene by hanging and

stretching an 18-foot duratrans photobacking we had made from one of the 4 x 5 negatives. The backing was then suspended at the rear of our reflecting tank and then lit to approximately 11 at $\frac{1}{50}$ th of a second. The system was placed at the other end of the tank, with a projection screen at the left side at the same focal distance as the center of the water tank. With this positioning the camera could then see two identical pictures superimposed off the beam splitter. By alternately blocking first one view and then the other, two pictures were aligned for both sizing and position. As this positioning was adjusted I also adjusted the camera height in relative scale to the water tank.

This completed the location shooting of all the scenes except for the still undetermined frozen lake shots. We returned to Los Angeles carrying the exposed, undeveloped VistaVision footage by hand. To assure a good match between the effects footage and the principal photography, I post-flashed half of the negative from the VistaVision takes. While shooting, I had edge notched the end of each take, and upon returning to L.A. I separated all the takes and sent half of the footage from each scene for flashing. The other half of the takes were developed normally. After development, all of the negatives were wedged on both normal and flashed positive stock by Roger Dorney at Apogee to determine which color balance and contrast range would best match the film's look when rephotographed. The 4 x 5 negatives were sent to Color House and Mark's Color Lab to be printed as duratrans for the purpose of creating reflections in the water of the flood scenes. I made trips to both labs on a daily basis to compare duratrans swatch tests to the work print from the film for color and contrast.

Matching the color and contrast of the matte painted bridge to the filmed bridge and then matching them both to the first unit footage proved to be a difficult task, but in the end we were suc-

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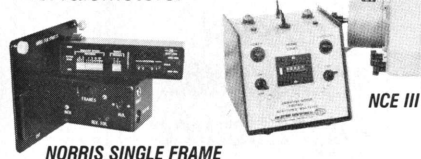
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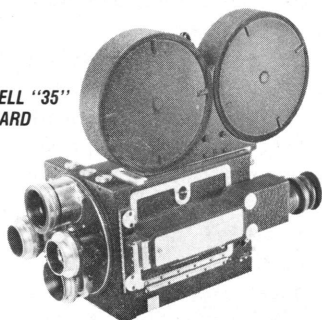
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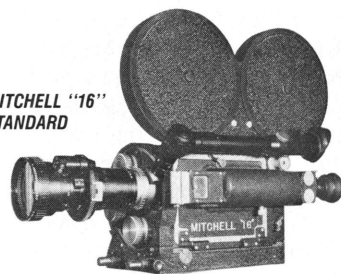


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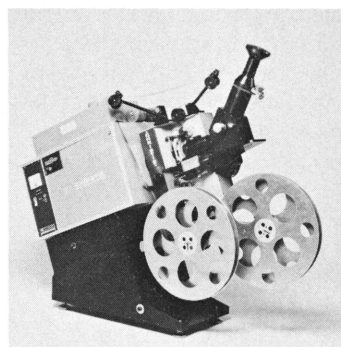
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cessful. The key establishing shot was done in two different versions, a wide shot and a medium wide shot. The medium wide shot appears in the finished film with new mountains and clouds on the horizon, two miles of seamless lake and two miles of trestle bridge. A locomotive pulls a freight train over the bridge as the two little girls run up the shore to join hands with their grandmother.

Meanwhile, several other key elements were taking shape. Assistant cameraman Chris Woodward began the task of adapting a pin-registered VistaVision projector, a Mitchell MK II camera, and a nodal point pan tilt head for motion control use. Research was done to determine which trains and engines were typical of the period and locale. Model makers David Sharp and Scott Alexander were employed to build the train and other models that would be used for the shots. Matte painter Adam Lustig began laying out and painting the two mile train bridge, while the model crew set up some twenty feet of HO gauge model railroad track on the far side of the painting to match the perspective of the shot. The final projection plates for both the distant mountains and the foreground scene including the actors and practical bridge set arrived from the lab.

Two large panes of glass were then interposed, one between the system and the projection screen, the other between the system and the water tank. Both were placed as close as possible to both the tank and the screen. Tim then began to rough in a matte on one glass and a counter matte on the other. The matte in front of the projection screen was hand drawn using the survey tape marks on the film so as to block out only the area where the water would fit into the scene. The matte in front of the water tank was hand cut as an exact answer matte, and allowed the camera to see only the water area, and not the actual Duratrans. The photobacking was used only to cast a reflection in the water.

The tank was filled and

dressed with the debris of a flood, and colored to look muddy. Weighted sections of clear plexiglass "fence" were placed just below the water level to direct the wave action. These were placed so as to bounce the waves off solid objects that broke the "water level" in the VistaVision scene. Practical shorelines were placed in the water tank and positioned to match the shorelines in the VistaVision plate, to give the feeling that the water was actually connected to the scene. Set pieces and props were placed in the rippling water tank to affect the waves as they wrapped around objects in the VistaVision plate. Small pieces of wood, fence posts and leaves were placed to match the scene, and the testing began.

The final shot was composited in two passes. First, we draped black velvet over the front glass and photographed the plate at 24 fps. The film was then backwound in the camera, the velvet

was placed on the projection screen, and the water was photographed at 72 fps.

Using the same techniques, we began work on the town square flood scene, but for this shot we added a new wrinkle. Using the motion control, we built a pan move into the shot. We used the motion control system to rephotograph the VistaVision plate at 24 fps, while the rest of the scene was held latent by placing a black velvet over the matte glass in front of the water tank. We then backwound the film to zero frame on the motion control and blacked out the projection area with the black velvet. The water tank area was exposed at 72 fps, repeating the same camera movement exactly. The result is a beautiful panning shot over the flooded town square, complete with puppeted reflections of people coming and going, flooded cars floating into the scene, and the row boat with two men passing bags from a

flooded house.

Following a three week hiatus to allow winter to catch up with the production, it was decided that the "train wreck/hole in the ice scene" would not be shot on location. The danger involved in building a set on a frozen lake and then blowing a hole in the ice was too great. The scene would be shot as a combination of effects and live action. We would have to create believable effects under the most difficult of circumstances: in broad daylight on a field of snow, matching live action footage.

It was determined that we would shoot the scene at sunrise. The practical bridge set had been pulled out of its location during hiatus and moved to an open area near the abandoned plywood factory that served as a sound stage. A pond was dug in the small meadow where the 200-foot bridge had been re-erected. An ice set was built around the pond and the rest of the

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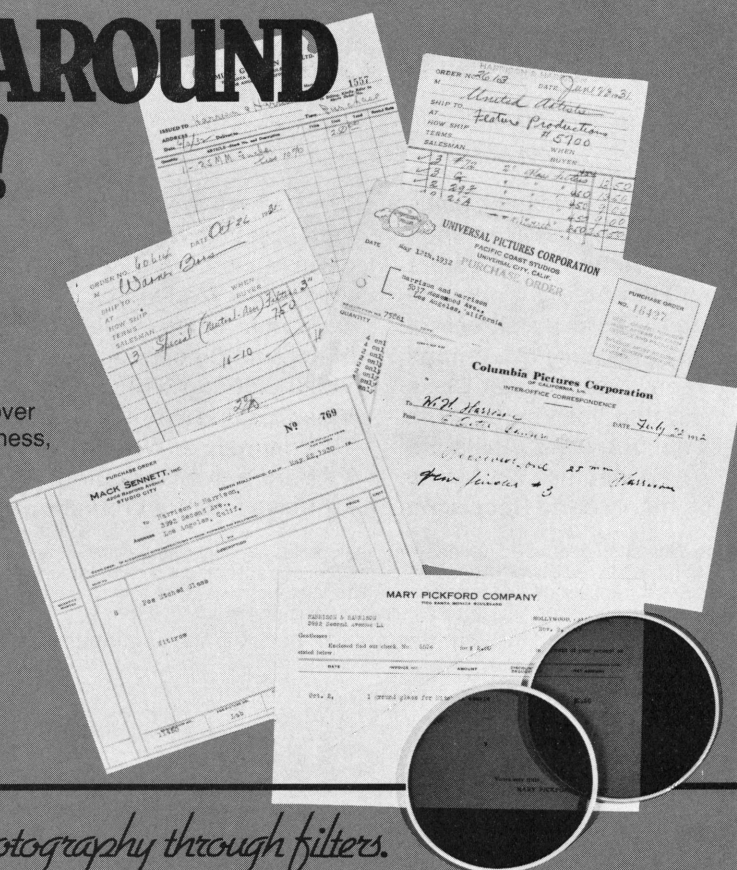
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meadow was surrounded by a five foot embankment to provide a false horizon. Two snow-making machines ran all day in an effort to dress the set, and nature herself aided production by providing several inches of snowfall the night before the shooting was scheduled.

Film has strange physical properties under normal circumstances, but in sub-zero temperatures, cameras and stock take on far more drastic characteristics. Our first test attempts at running the VistaVision camera under the circumstances on this location were frightening at best. The camera used was Technicolor Camera G-6, converted for VistaVision use during the fifties by Technicolor for the "Technirama" process, an early wide screen system. The loops at either end of the film gate took free-formed, 90 degree turns to the magazine. I quickly discovered that any attempt to thread the camera in open air at sub-zero temperatures was doomed to failure. The film became brittle and invariably shattered as I tried to fit it into the movement. It was obvious that keeping both film and camera heated would be essential, to avoid breakage or fogging. An enclosed heated camera platform was built on the location, and great pains were taken to keep the camera warm overnight and en route to the location. Once again I edge-notched the negative after each take, and in a matter of a few hours the filming of the live action portion of the scene was complete.

The distant mountains across the lake had already been established in the earlier train bridge shot, so we returned to the Cootenay Bay location to shoot winter plates of the distant shore. At the edge of the lake we came upon a magnificent view of snow covered mountains and lofty backlit clouds. Using clips from the work print of the previous bridge shot we lined up the mountains and completed the photography.

Back in Los Angeles, we began work on the final scene. The film was divided and sent in for the flash/no flash treatment as before.

Because of the higher contrast range of this scene, I did further testing to determine a combination of positive flashing and color correction to match clips from the rest of the scene.

Tim Donahue began roughing in the painting, using a registered work print from the scene, and when the plates arrived the composite work was quickly begun. Tim worked painstakingly at the difficult task of matching the matte painting to the live action footage. This meant matching a wide range of contrasting areas. It was necessary to match the painting to both the unblemished snow and the very dark practical bridge piece in the plate, while keeping the entire composite within the range of reproduction of Kodak 5247 stock. Through skill and testing Tim achieved a beautiful and undetectable result. The wide establishing shot that appears in the film shows a two mile wooden trestle bridge across a wide expanse of frozen lake. The distant mountains wear a blanket of snow and the clouds roll overhead as a search party makes its way to the edge of a hole in the ice. The shot tells the story economically, safely and – best of all – convincingly.

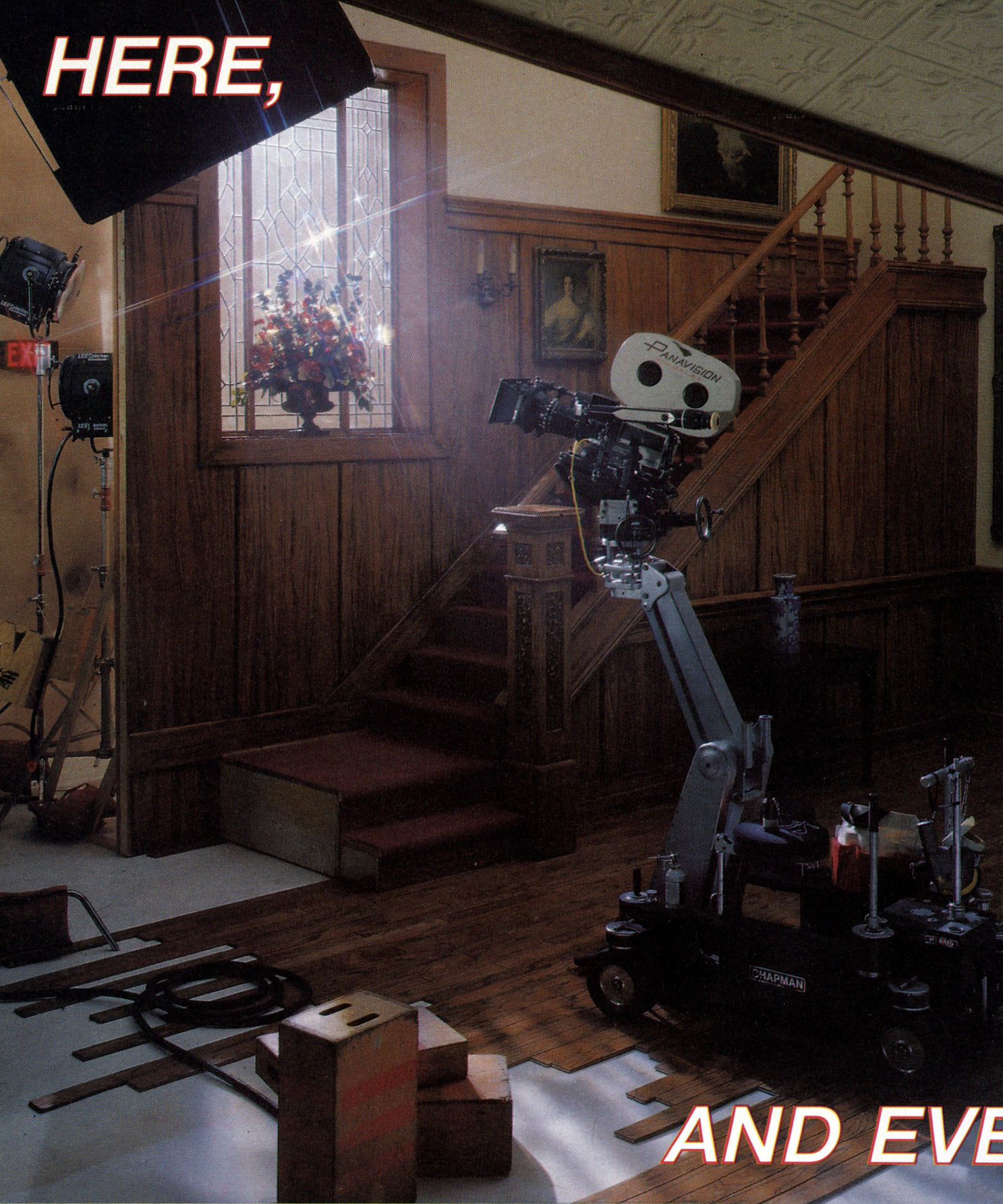
In a business where the main concern is the willing suspension of disbelief, the best compliment the work can be paid is when the viewer asks the effects man "Which part did you do?" My greatest overall satisfaction with the work done on *Housekeeping* is that it exactly fits the picture, that the visual effects, however sophisticated, did not detract from the human tone of the film. △



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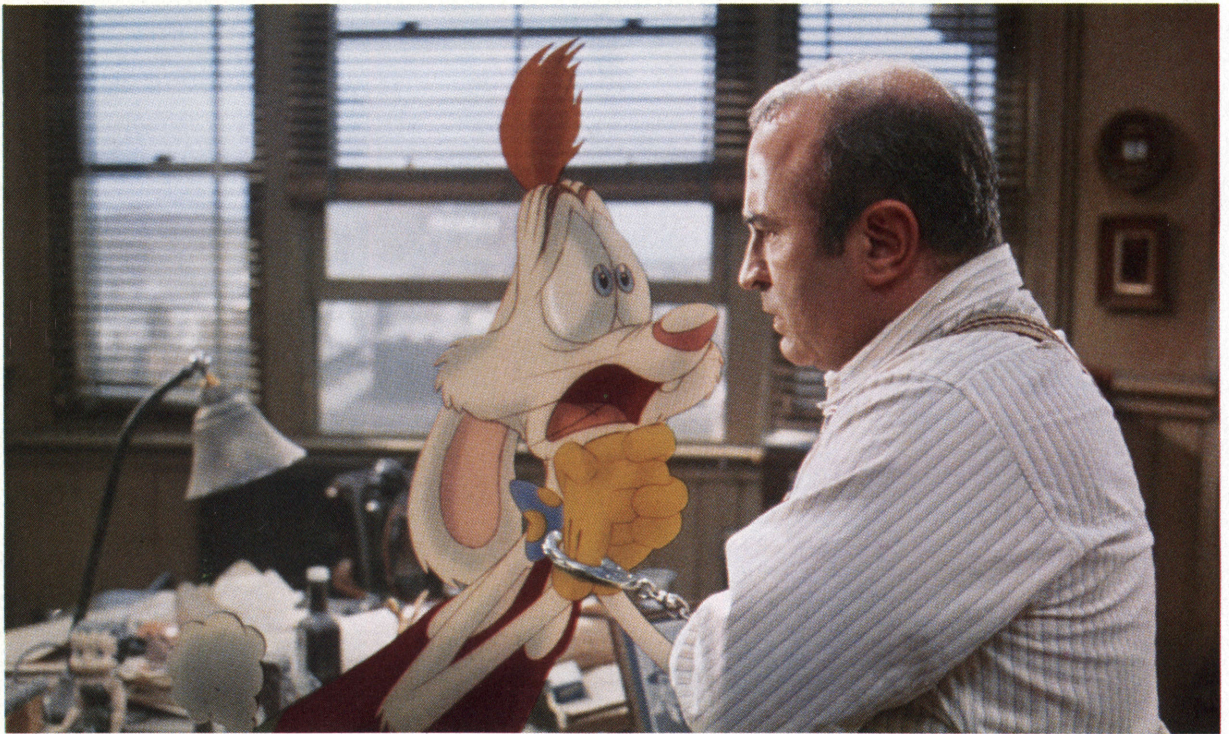
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Who Framed Roger Rabbit?

Produced by Steven Spielberg and Kathleen Kennedy
 Directed by Bob Zemeckis
 Photographed by Dean Cundey, ASC

by George Turner

Who Framed Roger Rabbit? is not an easy show to describe. To say that it combines live action with cartoon animation, while truthful, doesn't begin to say to what extent or with what skill this has been accomplished.

The basic idea isn't new. Max and Dave Fleischer did it with their *Out of the Inkwell* cartoons in the 1920s. Walt Disney put his cartoon creations into scenes with human actors in full color in *The Three*

Caballeros, *Song of the South*, *Mary Poppins*, and other well-loved shows. Who can forget that great sequence in *Anchors Aweigh* wherein Gene Kelly performed a dance routine with his fellow MGM stars, Hanna-Barbera's Tom and Jerry? More recently, some notable work in the area has been done in television commercials.

Yet, it will have to be admitted, these landmarks of filmic delight are almost primitive, tech-

nically speaking, alongside this collaborative effort of two entertainment giants, Disney and Lucasfilm. Heretofore, there has been a definite demarcation between live action characters and cartoons: the human actors are real and the cartoon characters are strictly from fantasyland. In *Who Framed Roger the Rabbit?* the audience must suspend its disbelief long enough to accept the idea that the cartoon characters are as real as Bob Hos-

kins and the other flesh-and-blood co-performers. It's a comedy-murder mystery-chase thriller, done on a vast scale and filled with homages to the great cartoon creations of the past. Its realization was possible only through the determination of a lot of talented professionals to broaden the parameters of cinematic expression.

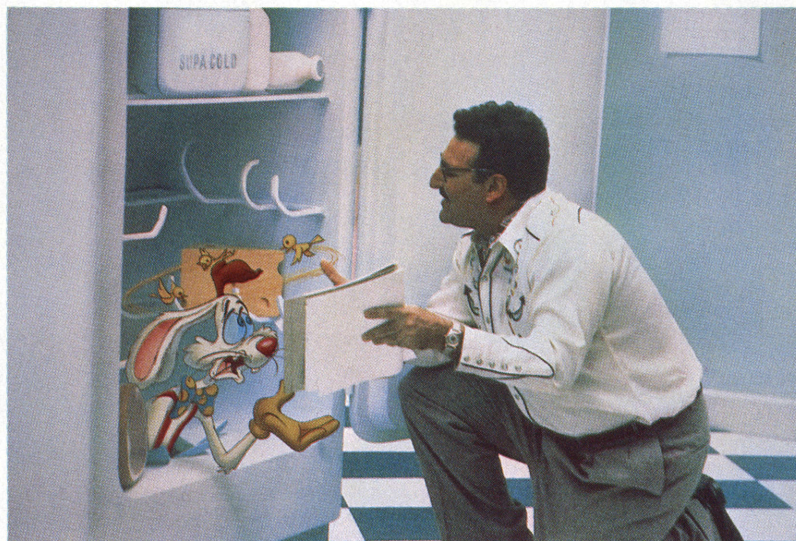
A key member of the team is its director of photography, Dean Cundey, ASC, whose tantalizing descriptions of *Roger* in various stages of production make the story of this film a fascinating one.

"It's a unique project," Cundey understated.

"Technically, it's an English production. It was financed by Walt Disney, Ltd., a British firm. Most of the principal photography was done in England with a predominantly English crew, many of whom worked on other Lucasfilm projects such as *Indiana Jones*. It's about Hollywood in the 1940s, so we had to recreate Hollywood in England, even to bringing in palm trees from Spain. We did some exteriors in Los Angeles, and we did a lot of blue screen work in San Rafael, but the United States actually was a distant location for us."

He began preparation in England in August, 1986, returned to the States for three weeks in November, and went back before Christmas, remaining to do the British Lion's share of principal photography. Two production units worked around the clock at Elstree Studio until the end of April, 1987. There was a three-week shoot of street action in downtown Los Angeles, and more months of blue screen effects photography at Lucasfilm's Industrial Light and Magic facility in Northern California. Altogether, Cundey was involved in *Roger* for almost two years.

"After our initial talks, we adopted the general policy to do everything exactly as if the cartoon characters were alive, in the way we normally tell a story in a film," Cundey recalled. "With minor exceptions we were able to do that and the film benefits greatly. I read an article in the newspaper recently which stated that the animators



Opposite: Compositing frame with *Roger Rabbit* in the office of private eye Bob Hoskins. Above: A "big red car" arrives at the entrance of the Maroon cartoon studio on the Sunset Strip (actually it's a movie studio on Cahuenga). Left: *Roger* consults with his director (in the movie).

were concerned with the fact that the camera moved so much, but most of the animators I've talked to said that the great boon of the picture is that we didn't adapt our technique to an easier, more conventional way."

Cundey was enthusiastic – mostly – about working in the British studios.

"The English, during the development of their film industry, have evolved a somewhat different technique than the American system regarding the personnel they

have and how they work. It was interesting to adapt to their ways, taking the various job assignments and getting them done in a little different way. We saw that some of them could be extremely useful in the American system if they were applied to it.

"In this country we have two groups of technicians: the electricians, who set up and operate the lights; and the grips, who handle flags and nets for controlling the light, set up scaffoldings for elevating the camera and lighting equip-

**Villain Acme
(Christopher Lloyd)
and a geyser of
Toon folk.**



ment, and mount the camera in various places such as on automobiles.

"In the English system," Cundey noted, "there are no grips as such. They have a camera grip in charge of moving and taking care of the camera, but all the other jobs that the U. S. grip would do are spread out among the electricians and a group that they call 'riggers,' who work with scaffolding pipe. The setting of flags, nets, scrims, et cetera, is all done by the electricians. Where we would have perhaps four electricians and four grips, they hire more electricians – say, six – so they'll have enough men to set nets and flags, and two

riggers to handle a lot of the other construction work. There are the same number of people on the crew as we have, but the assignments and job descriptions are different."

The pipe rigging system, Cundey learned, is highly efficient. "It's amazing what the riggers can do! For my next show, *Road House*, we're building a set in a warehouse with no chance to mount catwalks above the set as we could in a studio, so I'm going to adapt the English pipe system of hanging lights. So I'm already taking advantage of some of the things I learned in England.

"We had an extremely good art department. The sets were

built using slightly different techniques in construction and painting. I gained an understanding of why European pictures look somewhat different than American films. They use fewer light control devices, such as nets and scrims, than we do. Only recently have they started using some of the things we use because some of the English technicians have travelled to the U. S. to do commercials and when they worked with American directors of photography they'd adapt some of the American techniques. More typically, they use just lights and the European pictures reflect that in different looks."

Cundey described how the duties of the English cinematographers differ from those in America. "The lighting camera-man does the lighting and the operator works with the director to select angles and so forth. Because our director, Bob Zameckis, was American and I brought my own operator, Ray Stella, and my VistaFlex assistant, Clyde Bryan, we worked essentially in American style and adapted that to the English crew system. Ray Walthour was our chief lighting technician.

"We had an English second unit and sometimes a third unit that would often follow behind us and they shot a lot of the effects sequences and pieces that we needed. Heading that was Paul Besson, an excellent English cameraman, so we had a top quality second unit. It was interesting working with Paul and watching how a purely English system worked.

"Elstree," Cundey said, is "a very interesting studio. Lucasfilm has been using it for some years for their *Star Wars* and *Indiana Jones* shows. We looked around at some of the other studios because we needed a very large set at one time, but we ended up building the set in an old deserted factory building in London. Working there was probably the hardest part of the show, partly because it was so cold. The winter was one of the coldest they've had in about 40 years, getting down to 15 to 20 degrees, and

the building was not insulated or heated. We were working early mornings and throughout the day with heavy jackets on, and we were on that set for three weeks. The sequence for which it was used is the big climax of the picture and it involves a great deal of effects and action. Because the interior gets destroyed gradually, the second unit had to work almost simultaneously with us. We would show up at seven o'clock in the morning and work until six or seven in the evening; then, as we were leaving, the second unit would show up and they would work all night – when it was even colder! – until seven in the morning. The inside of the factory and our VistaFlex camera were busy 24 hours a day for at least two weeks and the lights we rigged were burning constantly. Some of them were never shut off except when it became necessary to change a burned out globe."

The lighting equipment, Cundey found, was not markedly different in function than what he was accustomed to, although most of the units were not the same ones that are used most commonly in the United States.

"They substitute different but comparable units, frequently the IANIRO products from Italy. The HMI lights were either Arriflex or LTM and are French. Most of the equipment is somehow similar to what we're used to as regards the output of light, such as 1K and 2K. They've begun to build grip equipment that we're familiar with – century stands, nets, et cetera. They have a few of their own inventions that were quite useful and, like most motion picture equipment, they have unusual names. They have, for example, "onka-bonks," which are a series of pipes which plug together and are used to support lights. They come in lengths of anywhere from six to about 18 inches, and each section can be put together with others and used to raise or lower a light from a mounted position, whether overhead or on the floor."

Although the picture is being released in standard 35mm format (as well as in 70mm blowups



Above: Weasel gangsters commandeered a vintage patrol car. **Left:** Roger encounters his arch-enemy, Acme.

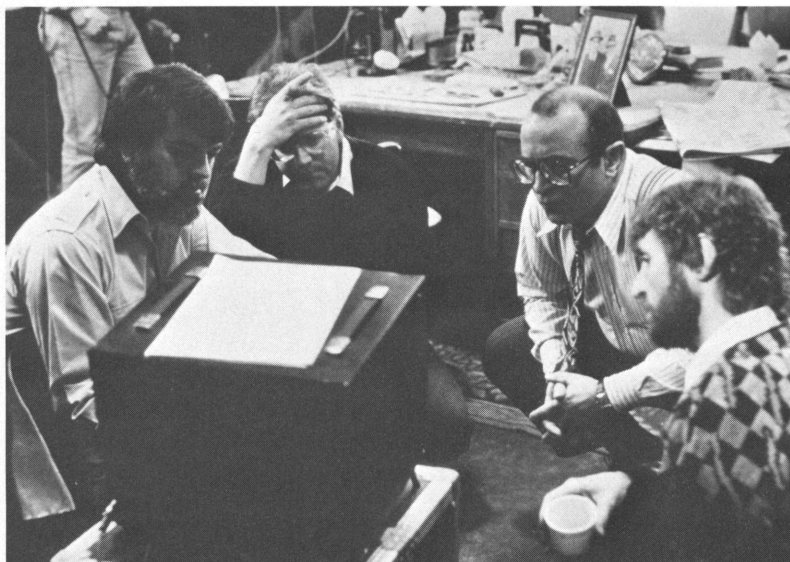
for some key locations), about 80% of the English footage was photographed in VistaVision because it included blue screen elements that eventually would be composited with cartoon elements. This permits optical duping of highest quality, the larger size of the original compensating for any generational loss.

"I learned to speak English as well as American," Cundey said, "but they still use Cockney rhyming slang a lot, which can be confusing. It was fun because Hos-

kins is Cockney and a lot of the crew are either Cockney or used the slang, so it became a cultural experience learning to understand when they were talking."

For the street scenes made in downtown Los Angeles, two blocks of Spring Street between Seventh and Ninth Avenues were revamped to resemble Hollywood in the 1940s. "They built two red cars – like the trolleys that used to run through L. A. – re-did the facades of a large number of buildings and added signs," Cundey re-

Cinematographer Dean Cundey, director Bob Zemeckis, Hoskins, and producer Robert Watts study video playback.



vealed. "We had the trolleys and a lot of vintage cars running through the streets. A car chase takes place there, and it's interesting in that the car Bob Hoskins is driving is an *animated* car. They built a small motorized car – almost a go-cart kind of thing – in which to move Bob around rapidly, and then the animation is placed over the top of that. Roger Rabbit, who is riding with Bob, is placed over that also.

"We built full-size, bendable rubber rabbits to use as stand-ins to help with the lighting and staging. Each time we photographed a scene we would always do one take using these large, poseable figures, which were built for principal animation characters such as Roger, the weasels, and a couple of the other characters. These proved to be extremely useful devices, because the operator was able to see their sizes in relation to the actors. The director or I would then move the character through the scene as it was rehearsed, so that everybody would understand what the action was and where the character would be moving. The operator would then be able to see how fast it moved and decide how to compose. Then, when we shot the scene, we didn't use the figure and the operator would have to just imagine where the character was in relation to the dialogue, which was being delivered by an off-camera actor. The actors in the scene were able to do

the rehearsals with the figures, visualize what the action was going to be, and then during the actual take they could draw upon memory what the figure had done when brought through by the director."

Last Fall, while Cundey and visual effects supervisor Ken Ralston were working on further blue screen shots at Industrial Light and Magic, *American Cinematographer* observed some of the unusual methods being used for the first time in depicting Roger's adventures.

Hoskins and some of the other players were there, costumed in styles of the 1940s. Remarkably, Hoskins' Chicago accent was perfect, with no hint of his British heritage in evidence. Another actor was being heard but not seen – the exceptional nightclub comedian, Charles Fleischer, who provides the voice of Roger. It was strange to see Hoskins sitting in a nonexistent car in front of a brightly lighted blue screen while talking to a big, rubber rabbit whose raucous voice came from off camera.

Cundey introduced Bill Frake, an artist-technician who was working with swift efficiency at a table on the stage. "Bill is doing layouts as we set up this whole video compositing thing and the blue screen stuff you saw, which we will composite here," he explained. "But then he has to figure all the perspectives and vanishing points and sizes of doorways and stuff like

that, so I'm hoping to spend some time in that area working with him. Having lit the scene" – he indicated Hoskins being positioned for a blue screen setup – "I have to designate on the backgrounds where the lighting sources are and locate fixtures, things like that."

The crew took some time off from the feature to photograph a commercial for Diet Coke on the smoke-hazy nightclub set. The tables were set up on tiers and all the players were dressed and made up in the styles of 1947. The resemblance to the paintings by Elvgren, Sundblom, Loomis and other great illustrators whose work graced the Coca Cola posters and ads of the period was striking.

The daily screenings were intriguing, being a mixture of scenes in various stages of completion. Some were live action blue screen shots to which optical effects had not yet been added. In these Hoskins, often rim-lighted in yellows or reds, was seen acting with the invisible but noisy rabbit. Sometimes the camera would swing out to take in areas of the stage outside of that which would be seen in the final composites, panning across crew members and equipment to give the animators help in planning movement. Others were live action shots that had been test-composited with animation still in the penciling-in stage, the slimly graceful lines of the artists' work swirling smoothly like ghost images over the scenes. Some composite tests in later stages showed finished color cells acting in concert with Hoskins, but not all had been refined to the point of having sufficient density, sharpness (or softness) to create a convincing blend. Then there are the finished shots, which must be seen to be believed, in which all the details have been tweaked and polished to an astonishing degree.

The complexity of the technique employed throughout most of the picture made color timing of more immediate concern than usual. "Most likely the final timing will be done at Deluxe in Hollywood, but this is an unusual picture in that all the backgrounds



Above: Cartoonist's ideal, Jessica, seems palpably real in her nightclub act. Below: VistaFlex camera set up in the smoke-hazy nightclub.

are going to have something composited over them, whether animation or effects," Cundey revealed. "Early on, we decided we had to consider the end result very carefully because everything we were doing in pre-production and during production was going to greatly affect what was going to be done eventually. This includes even the timing, which normally isn't done extensively until after the negative has been cut. As we were working we had to consider the end result and almost think backward, always considering the post production work involving all the animation of characters who were only going to appear later. We were shooting them, you might say, at the time of production.

"All of the work that has to be composited into the live action that we've shot has to match and be consistent," Cundey emphasized. "On this picture there are many shots that were done at varying times out of sequence during production. A lot of times they kept one shot out of this scene and another out of that one, so I went through the dailies with some of the guys from ILM and Steve Starkey, who is supervising post production, and we selected 'looks'

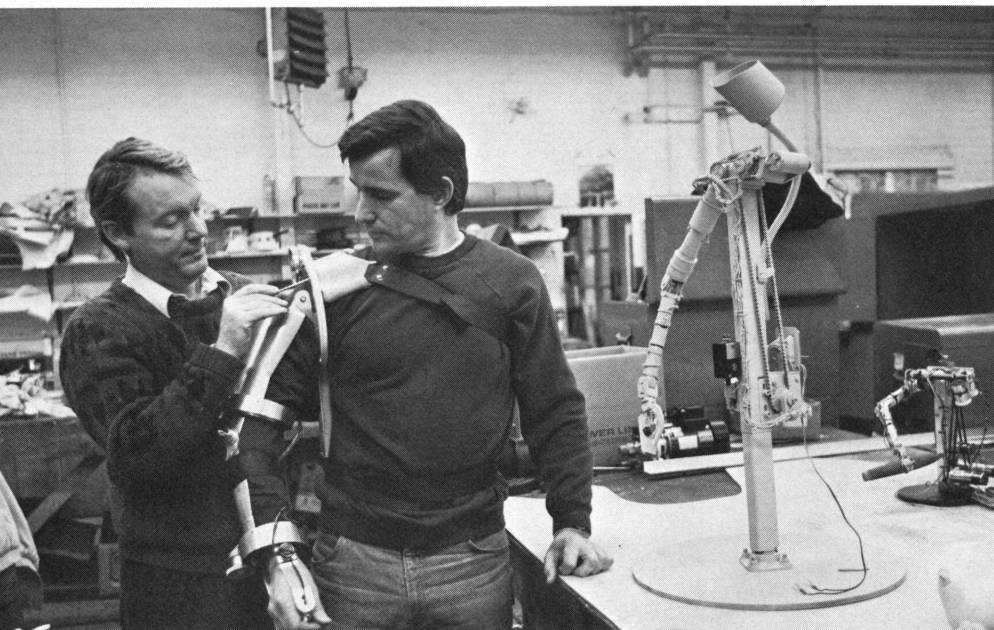


out of existing footage even before it was cut together. If we didn't find any shots that looked proper as to color and depth, we went to the trouble of timing them then, so that there would always be reference pieces from which to work while doing the compositing. It's one of the few pictures where I had to time the picture before they even started printing anything.

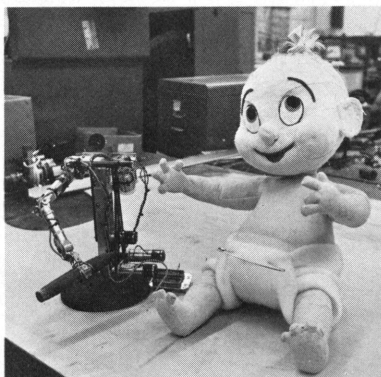
"Now they've prepared a book of selected shots that they use for their optical wedging to get the color right, and anytime they get a

composite for a particular scene they go to their reference 'swatches' and try to match it all to what was selected to represent that particular scene."

In mid-April, about two months prior to the scheduled release date, Cundey (who was by then involved in the making of another feature) reported that about 750 of the 1031 optical shots had been completed. "They're now in a position to start cutting some of the negatives for the reels, and they want to run through the work



Above: Control arm used to operate the electronic arm that manipulates objects supposedly handled by Roger. Right: Stand-in model of Baby Herman with Herman's electronic arm. Below: Hoskins, riding the mechanical car which is hidden in the film under an animated auto. VistaFlex is mounted on a Cam-Remote which rides on a Shotmaker.



prints. Over the next month or so I'll be meeting with them consistently to time the print as it comes out. Most of the time when you finish a picture you may have anywhere from three days to a week to look at answer prints and time them, but this will be probably spread out over a month or more."

The varying needs of the

production dictated the kinds of film stock to be used. All original photography intended for compositing was photographed in the eight-perforation horizontal VistaVision format, while the normal action photography was done in the regular four-perf format.

"We have probably run almost every kind of emulsion there is," Cundey noted. "ILM uses Kodak's 5247 for almost all their blue screen stuff. They've been testing the recently introduced blue screen material, 5295, but apparently it takes some readjusting of the handling of the timing and compositing until they get used to it, and they're still in the process of working all that out. We used the new 5297 daylight balance and some 5294 for some of the regular four-perf stuff – night exteriors and so on – and stayed with 5247 for most of the stuff that has to be composited.

"Inside the large factory at the climax of the film there is an extensive sequence where we didn't want to use 5294 but we didn't have enough speed with 47, so we used Agfa's 320 speed film, which ranges somewhere between 5294 and 5247. ILM had to re-calibrate their usual timing procedure because the color balance is a little different.

"I like the Agfa," Cundey

added. "It's a different look. We found that the grain was finer than 94. The color is a little warmer and they found that when they composite it tends towards green, so they have to add more red to get it to match the Kodak. We used it in a different situation than we might if we were shooting a regular picture, so I'd like to try it further under regular conditions. When we were shooting in England and the question came up of what to use when we had to have a little faster film, most of the English guys I worked with had used Agfa. Paul Beeson, who did our second unit work over there, had done quite a bit of work with it and he recommended it. We tested it and the guys at ILM checked it to see how it would go with their compositing work, and they found that, while the grain was not as fine as 47, it was within their tolerances."

The cinematographer and his crew were enthusiastic about the new VistaFlex camera, which received its baptism in the making of Roger. It is decidedly different in appearance and in functional details from any previous camera. Cundey was involved in the design of the VistaFlex in collaboration with the ILM technicians.

"Since the show is almost all effects, about 80% of what we did was done in VistaVision," according to Cundey. "ILM had been talking about building another plate camera because the EmpireFlex – which is their small one – was being used so much. Then, when *Roger Rabbit* started to become a viable project, almost two years ago, I said it would be desirable to have a good production camera and they said they were thinking of building one. They started off with the intention of building one out of a couple of movements they already had.

"I came up several times and talked to Mike Bolles, the design engineer, and he asked, 'If we did make a production camera, what would you like to see on it?' We made a list of things they hadn't really planned on doing, like follow focus, crystal sync, quiet operation, video-tap and so on. Over a period



Full scale, pose-able models which substituted for cartoon characters on location in the Acme Factory.

of time they built a wooden model and I brought in Clyde Bryan, an assistant I've worked with a lot, and he gave them opinions of what an assistant would like to see on it and how he thought it could be made most workable, including aids to carrying it, a hook on it for tape measures, and follow focus. They hadn't initially thought of follow focus, because on the other cameras they generally just fix the focus and don't do a lot of follow focus work. They asked, 'how about a manual follow focus?' The problem with the Nikon lenses is that it's so hard to see them, which gives the assistant trouble, so we said, 'how about an electronic one?' They found a very convenient electronic system that is made in L. A. and it interfaces with Hayden follow focus and zoom movements. They built that into the camera and put the rings on the lenses. We modified the video tap to put on a color camera, so we could do our special matting work on that."

They also decided where the handles should go, how the camera should open, and what the

length the eye-tubes should be. They put in eyepiece heaters and numerous other features designed for the convenience and speed of a regular production camera. "The technicians have done a remarkable job," Cundey enthused. "The motor was built by one of the engineers at Cinema Products. Magazines were modified to have built-in tension takeup motors, so there is no need for belts. The pellicle for the video camera can be changed so we get more or less light to the video camera as may be required. We can slide the ground glass in and out and put frames on it for optical line-ups so that it can be used as an effects camera. When they got it built it was a little noisier than we wanted, so I made drawings of blimps. A couple of the guys in the model shop made a foam model and it gradually progressed till we made a large crude model to test it. It worked, and they refined it.

"We were able to shoot with production sound film that ordinarily would have to be looped entirely because of the noise of con-

ventional VistaVision cameras. It's built of foam, layered with fiberglass and it has multi-layers of sound dampening and absorbing materials, a coated front window, and cables that pass through all the electronic readouts and controls. The base is a special dovetail they built in that's isolated from the rest of the base. The camera and blimp arrived in London just a day or so before we began shooting, and we were even making some modifications there as we shot. It was indispensable to the show."

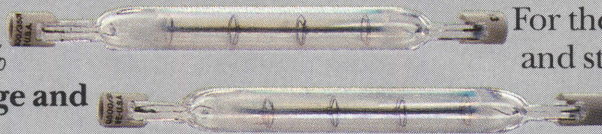
Cundey revealed that he already has used the new camera on another production which also required intricate compositing. "Recently I worked on *Big Business* at Walt Disney Studio. We were doing optical splits of Bette Midler and Lily Tomlin who were playing two pairs of twins who talk to themselves. Our first thought was to use the VistaFlex so we could record in it. It worked perfectly. What it means is that someone could now shoot a large-negative show which will yield theatrical prints of incredible quality." △

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Cartoons Come to Life in Roger

by George Turner

The special mystique of *Who Framed Roger Rabbit?* was summed up during production by the British line producer, Robert Watts, while he was examining test film clips in the optical department at Industrial Light and Magic.

"The picture starts off with a straight cartoon," Watts declared. "You go in and there are no credits, no distractions up front, no corporate logos, no Disney, no Spielberg, no actor names – nothing. You just bang into Roger Rabbit, a cartoon. Which is radical, isn't it? We had to get everybody to agree to this, and with all the vested interests these days it's difficult to achieve that sort of thing. For about two minutes it's a wonderfully zany cartoon, right back to the old days of the best of Disney, and maybe they want you to get a bit edgy: what did you pay your six dollars for, a damned cartoon?"

"Suddenly, someone yells 'Cut!' It's the human director and they're shooting this on a stage. Roger is real! We pull back – and pull back some more – and then the drama starts. At that point they bring in the Bob Hoskins character, who's watching this, and he says, 'Toons! Ugh! I hate 'em.' You see, *we've got to make them believe, right from the start.*"

Making people believe in a movie isn't easy under any circumstances. It's no cinch to make people believe that Sylvester Stallone is really in pain even if he's drenched with blood or that Brooke Shields is really in love with whatever young actor she's wagging her eyelashes at. To convince an audience that a talking cartoon rabbit and his animated colleagues really co-exist in the same world with all of us working stiffs demands some high-grade moviemaking – fine

writing and direction, brilliant design and photography, sharp editing, sympathetic scoring, realistic sound, and the dedicated contributions of a lot of craftsmen and technicians. Yet, all these elements would be useless but for the protean efforts of the remarkable visual effects artists of Industrial Light & Magic.

Heading the ILM team was Ken Ralston, Academy Award winning supervisor of special visual effects, whose knowledge of all the arts and crafts of his field was crucial to the planning and execution of work that blazes some new trails. He previously supervised effects for *Star Trek II*, *Star Trek III*, *Cocoon*, and *Back to the Future* and was co-supervisor of *Return of the Jedi*.

"Roger is our biggest effects job yet," Ralston said last year, midway through production. "It's like doing all three *Star Wars* pictures in one." The intervening months of non-stop work did nothing to alter this assessment.

"The script went through many rewrites," Ralston recalled. "We broke it down into effects shots and all the various elements that would go into them. I began designing how to do these effects following meetings with the director, Bob Zemeckis, in which he gave us the direction he wanted to go. "As in all the films we do, we tried to integrate our work into the look of the whole film, so the effects would blend in and not stand out or disrupt. Bob wanted to approach this project – despite the fact that more than 1,000 shots in it were going to be effects shots – as he would make a standard, live-action feature, with as few technical restrictions as possible. Since Bob moves his camera, we had to devise

ways for the animators to plot objects in the set for the perspective shifts when they match their characters into it."

During this phase of pre-production, Richard Williams was hired as director of animation. The Canadian-born artist has headed his own animation studio since 1962 and produces TV commercials for England, the United States, Germany and France. His production of Dickens' *A Christmas Carol* won him an Academy Oscar and his short subjects have received dozens of international film festival awards. A probable *modus operandi* was worked out.

"A test was devised to try our theories and to see if this project was do-able," Ralston said. "One shot had Roger in an alley and another had Jessica getting out of her car. Objects were placed in the set for motion and perspective reference, plus Roger and Jessica references for size and lighting changes.

"The tests were great! Roger's test proved the movie was feasible. He looked a part of the scene even when the camera craned down and followed him. Jessica's test was valuable because it showed us that her character design had to be changed, as well as the approach to her actions."

Ralston quickly realized that a new method would have to be formulated to achieve on a more cost-effective scale the reality that was evident in the tests.

"When we were making the tests, the cartoonists put moving shadows on the animation figures – the kind of work that's never done except in the biggest Disney features," Ralston revealed. "Everybody liked it and wanted it throughout, but it was not practi-

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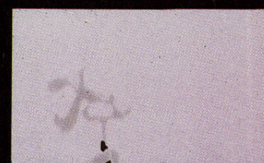
BLACK CENTER
RUNS WITH
BACKGROUND PLATE



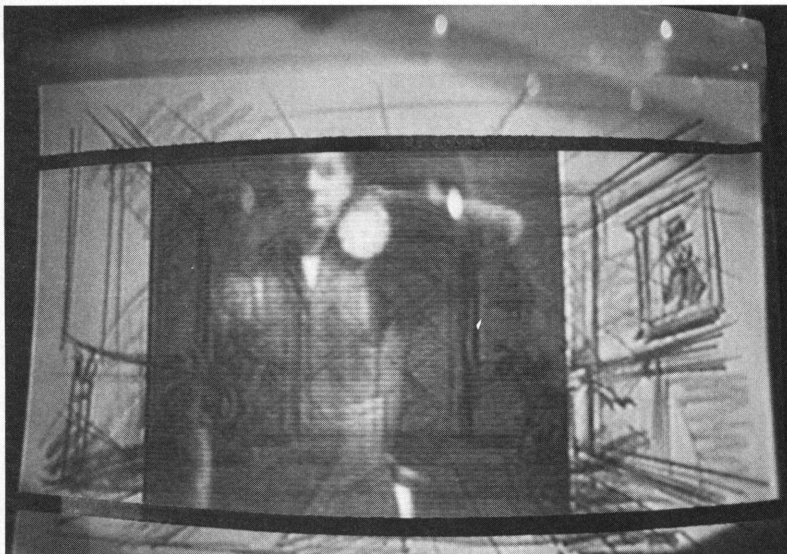
FINAL COMPOSITE



BLACK CENTER
RUNS WITH ROGER



A pencil test on Ultimate Video System screen. Camera assistant holds a focusing light.



cal. Therefore, because of Roger's huge size, we were able to devise simpler techniques to achieve the more complicated approach of the test. We put the shadows on in opticals. To give the characters a three dimensional look we came up with colored tone passes, shadows, and assorted lighting effect passes.

"We were trying to break the rules that have restricted live action-cartoon compositing in the past. We decided to use regular camera moves and atmospheric effects, to do everything we would do in a normal situation. We put levels of atmosphere in front of the characters. We have shadows. There are no limitations. Although we didn't use fogs on the lens there are scenes such as those in the Ink and Paint Club where we used a lot of smoke. Once again it was a case of 'here we go again, let's give it a try - we have to put cartoons into it and make it look like they're behind the smoke.' By flashing the characters and using smoke elements and things of that nature we've been able to set them into the scene just right."

Ralston projected a composite scene in progress in which Hoskins goes into the smoke-filled night club with the rabbit hiding under his coat, its ears sticking up from the collar behind the actor's head. At the time, the ears appeared too ethereal to seem a part of the scene. "We did a lot of softening in

the opticals trying to match the ears up to the scene. It came out a little too soft on the ears the first time, so we had to do a slightly harder one."

Unrestrained camera moves and atmospheric effects are only part of the look that makes *Roger* unlike any previous cartoon/live action show.

"We're rack-focusing from Toon characters to live-action characters and vice versa and throwing mattes out of focus - things we've never done before," Ralston noted. "I don't know if anyone has done them before. It puts a live-action reality in the shots that makes it very hard to figure out what's going on. People wonder, 'what are those things in those shots?' Yet, the point really isn't to have an audience thinking like that all the time; during the first ten minutes of the movie they'll be doing that, and for the first ten minutes there is very little plot information being given out because no one wants to cloud their minds with that, too. The whole point of our approach is that once they get past the technique they won't think of that at all; they'll watch the movie just as though there are only human actors in the scenes.

"The funny part, to me, is that you'll have to pinch yourself to realize that you've accepted so readily a Toon rabbit, a humanoid

woman character who is out of this world, and weasels which are running around getting beaten up by Hoskins. You'll just have to keep reminding yourself how outrageous these images are, because they're going to be accepted more easily than anyone will realize. It's a neat accomplishment, just technically."

Another question with which ILM was involved was what film format should be used.

"Super 35 was tested against VistaVision," Ralston said. "If Super 35 won out, then we were set - cameras and lenses were available. If VistaVision won, we'd have to build new cameras. You guessed it: the harder solution won. The VistaVision, using Eastman 5247 negative, had a color saturation and grain structure that cut in better with the regular four-perf footage.

"So, we proceeded to design a new user-friendly VistaVision camera that would have as many features as a Panavision. The cinematographer, Dean Cundey, was involved in the design. We built two cameras and blimps from scratch for *Roger*."

The first scenes to be done were shot in Los Angeles while the new cameras were being built.

"These were the exteriors of Maroon's Studio, Hope Street, and the Benny the Cab chase," Ralston recalled. "Six weeks of work were crammed into three weeks. Technovision cameras from England in makeshift ILM blimps were used because our cameras weren't scheduled for completion until the England shoot.

"Full scale rubber dolls were made of the main Toon characters for reference. We'd shoot one take using the puppets, when possible. This also helped Zemeckis in blocking out the shot. On the live action we used some cartoon-like lighting effects, with hard light on the sides of people and objects and extra colors thrown in. Even in outdoor scenes we put in some color edging in addition to the flat light outside.

"We went to England,

where we met up with our new cameras and their blimps," Ralston said. "Roger began shooting with two prototype cameras which had had very little film run through them, and they performed flawlessly for the entire five-month shoot! Most of *Roger* was shot in VistaVision.

"Simultaneously, we organized the animation department to ILM standards and we built VistaVision animation cameras."

Ralston emphasized the necessity of organizing the far-flung segments of the production into one smooth operation. "We had to coordinate England, ILM and, eventually, a Los Angeles unit, all into one, perfectly matched system. Not an easy task! Ed Jones, our optical photography supervisor, and Steve Starkey, post-production supervisor, were instrumental here. We also geared up the effects animation unit to the elements and techniques required. ILM was also called upon to create many of the animation effects.

"There was a tremendous effort in joining the actors, mechanical effects, and visual effects requirements when shooting. Every scene is a master stroke of timing. Zemeckis was brilliant in his ability to direct Hoskins and the invisible Toons."

The great size of the Acme Factory set, which was inside an abandoned factory building in London, forced a deviation from the method that had been established. "Using 5247 was impossible because of the low light levels," Ralston pointed out. "We tested several high speed stocks and discovered that Agfa High Speed gave us our best results."

Returning to the States after five months, the company set to work on the sequences in Toontown – home of the cartoon characters. At the same time, Ed Jones and his optical team began the task of putting together the complex shots that had already been started. Bill Kimberlin, the chief visual effects editor, had the formidable job of assembling the elements.

One of the more compli-

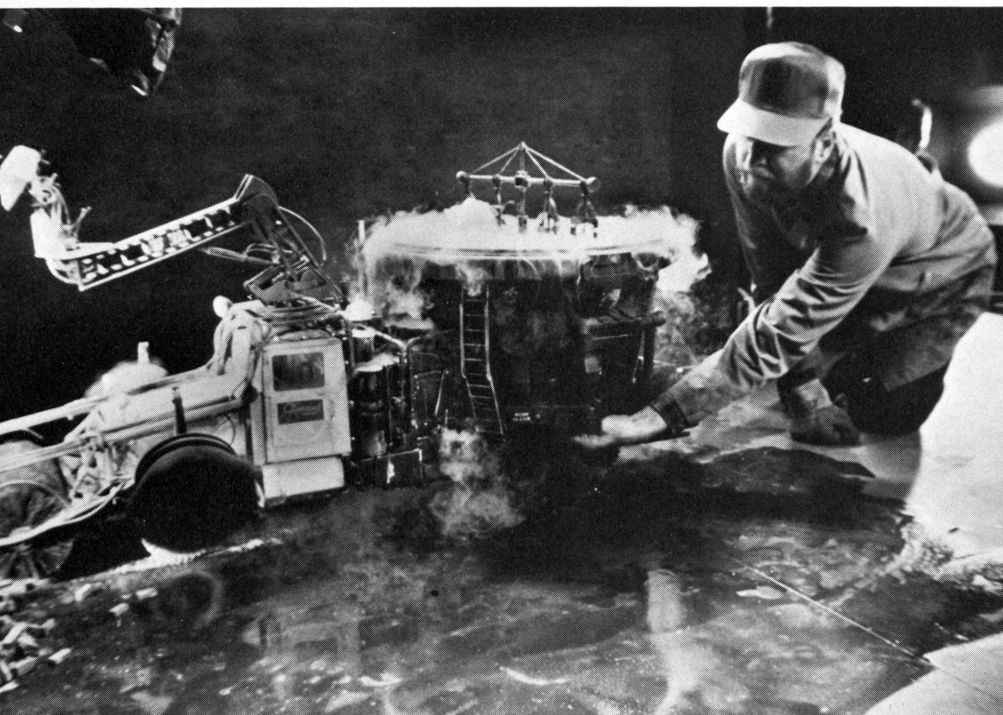


Above: Bob Hoskins, on wires, "falls" from a high window in front of a blue screen. Camera dolly move makes him seem to fall past lens. In photo are David Heron, Ken Ralston at camera, and Craig Mulhagen. **Left:** Hoskins, transformed by Tony Hudson, has been mashed flat in bottom of elevator.

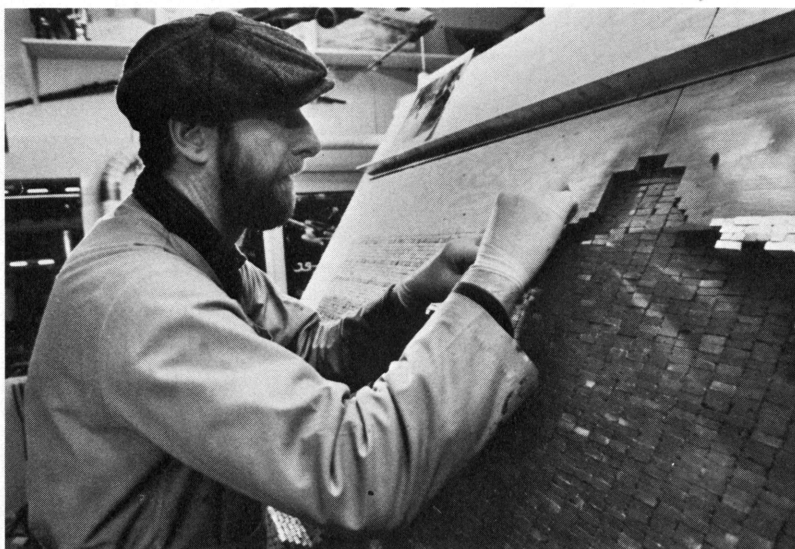
cated sequences follows Hoskins, playing Eddie Valiant, as he drives into Toontown looking for clues to the murderer of Acme. "This very difficult sequence was shot at ILM using our blue screens," Ralston said. "Hoskins was rigged into every conceivable bizarre position – flying, falling, running, tumbling, and anything else imaginable. To help Zemeckis visualize each shot, we used an Ultimatte video system. A layout artist sketched out backgrounds for the blue screen set-up with Hoskins and we mat-

ted them on a TV screen for Zemeckis so he could see roughly how they joined up. Perspective and registration marks were included in each scene to aid in plotting background moves."

The ILM miniature department has become famous for an impressive parade of spacecraft, time machines, caverns, ships, alien landscapes, and many other scaled-down creations necessary to depict the sense of grandeur and/or danger imagined by screenwriters. Ralston praised the elaborate and



Steve Gawley operates a miniature "dip truck" and vat of destructo dip (above) and builds a brick wall (below) for the truck to crash through.



unusual miniature work in *Roger*:

"Steve Gawley was our model supervisor. We built a 55-foot tunnel for the entrance into Toontown. A 3 X 3-foot transparency of a cartoon curtain was placed at the end of the tunnel. One of our smaller Empire cameras was rigged on a specially built dolly to travel down the road.

"A brick wall – 20,000 miniature bricks in all – and a miniature truck were built for scenes of the truck crashing through the Acme Factory wall into Toontown.

A miniature Toon patrol vehicle was made for several motion control shots of the car chasing after Hoskins and Jessica in the streets of Toontown."

The logistics of the production are such that it is hardly surprising that every department at ILM was deeply involved. "Toontown contains over 100 cartoony matte paintings for the entire environment," Ralston observed. "Plus, most of the scenes throughout the film have blue screen props, smoke, dust, water elements, light-

ing effects, and on and on. These were parts of the many separate pieces of the puzzle we had to solve to blend the cartoons into the live action to the point where an audience would accept them as real characters.

"The optical job on this show is monstrous."

The immensity of the optical effects work as well as the necessity to explore innovational techniques become apparent in remarks made by Ed Jones in the late stages of production.

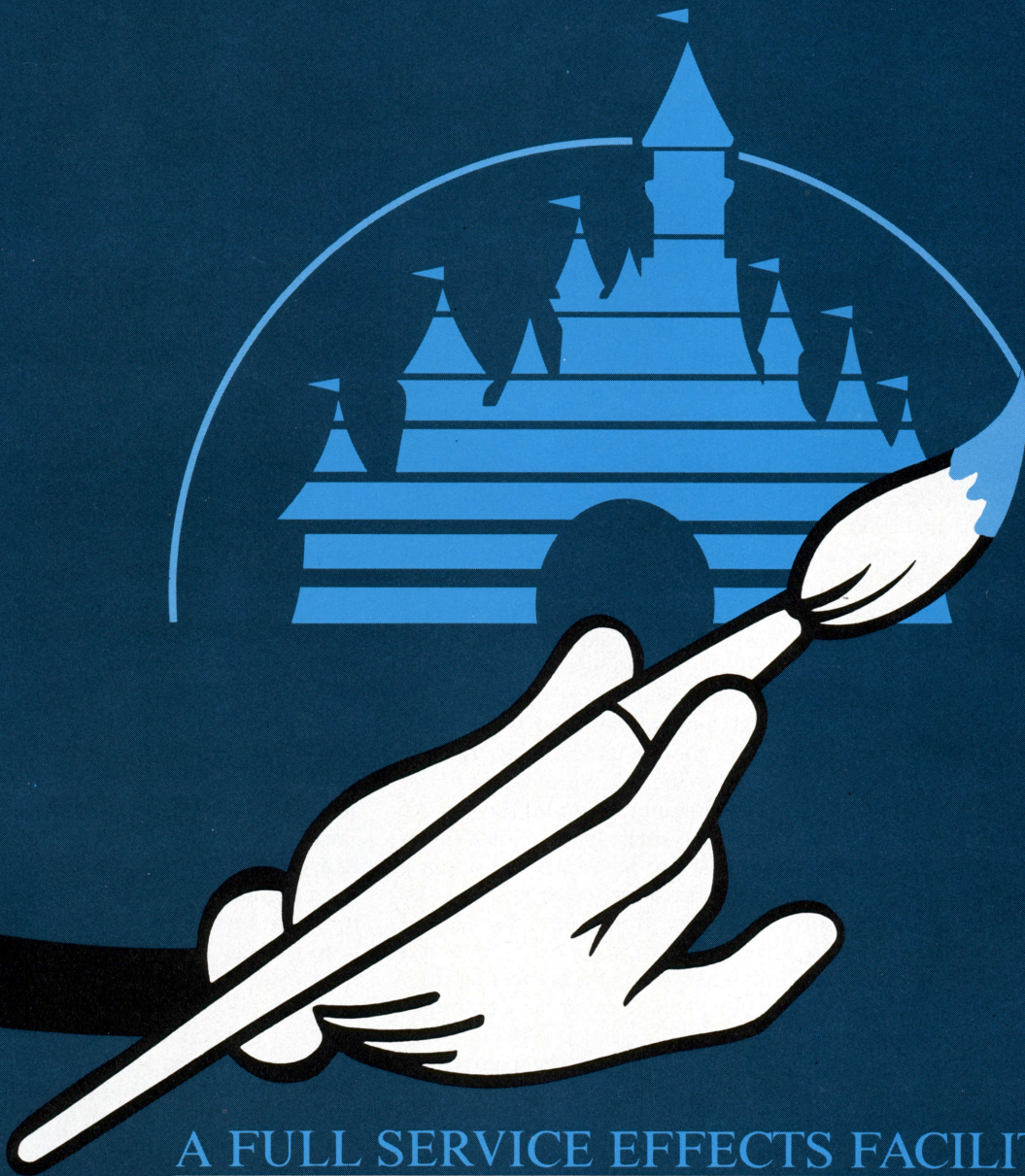
"This is actually the largest show we've ever had in this facility or, probably, ever will have," Jones stated. "To my knowledge it has the largest number of effects in any film. It has totalled up 1031 composites and we have shots that have more elements in them than any picture we've ever done. Some composites were on the printer for 10 hours at a time, and if we made a small mistake we'd have to start over, so it's quite mind-boggling.

"It presented many challenges from an optical standpoint. We implemented new technologies into the normal optical process and originated a new 3-D look for 2-D animation. Because of a schedule that provided us with little or no time to research other techniques, we had to experiment as each animated subject came over to us from Disney/UK. This involved choosing colors for all tone passes as well as researching and developing techniques while we were meeting deadlines."

The preliminary tests, Jones noted, differed considerably in method from the techniques used in the actual production, although the results were similar. "The early composite tests involved normal two-dimensional animation of "Roger" elements composited into live-action plates and using animated rim-lights over the 2-D animation. This test proved to be a strong selling point on whether or not these images could become three-dimensional.

"An additional test was generated using 2-D animation of Jessica, animated sequin passes,

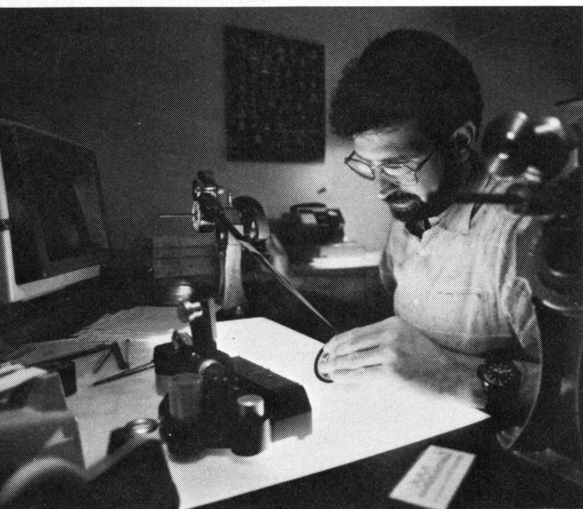
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Ed Jones, in charge of opticals.

animated rim lights, and animated clear centers of areas where we wanted to simulate texture. In assembling this composite, we used the clear center as the black center with a grayish density, then we double exposed over the color pass of Jessica. This provided a sculptured image with darker density in the areas that might not be affected by the key-to-fill ratio in normal live-action lighting. This test was very successful in constructing Jessica's image.

"In several conceptual discussions," Jones recalled, "we decided to stretch the sculptured look by implementing tests that the optical department had been working on. First, I created a palette of pastel colors on color print stock (SO396). It gave us a whole rainbow of colors, depending on the subject. Jessica got a red tone for her dress and orange for her hair and a flesh tone for her body. The weasels, who wear green suits, got a darker green. Baby Herman got a flesh tone. For Roger, the best for animation is to make a rather bright white behind him and add a tone with a pinkish, fleshy look. We used these colors with different types of diffusion and printed them through the animated clear centers that were generated simultaneously with the 2-D animation and shadows.

"We used the hi-con in the middle step and printed back, to a color print, what we call our black center or hold-out matte," Jones explained further. "We actu-

ally put color into these black center passes and then ran them on top of the flip-flop elements. For example, during a composite of Roger against a live-action plate, two colors were used to run with Roger: a flesh color over his white fur and a burgundy color over his red pants. A color was chosen for his shadow to match those cast on the live-action set. When viewing the final composite, Roger appears to match the lighting of the set and he became 3-D because he was sculptured with tone passes. We decided to call this two and three-quarter dimension."

Jones emphasized that not all of the composites consisted of placing cartoon characters into live scenes, but also placing an actor into cartoon scenes. "When Bob Hoskins ventures into Toontown, he is always a blue screen element. Here, the composites take on a very surreal feeling when combined with the animated backgrounds.

"By being around Bob Zemeckis I started to think like him and to understand what he wanted out of a shot. He trusts Ken's vision and mine, so that when we'd say, 'It looks good to us,' he'd say, 'It looks good to me too.' Since I didn't have a color print of the film the way it's cut – 80% of it is shot in VistaVision and we had to reduce that down – it was hard for me to keep a color continuity from scene to scene. I took a clip from each shot and started pasting them together until it began to create a continuity of color."

Many of the composites required a great deal of massaging because of the atmospheric effects. "That shot of Hoskins entering the nightclub with Roger's ears showing, for example, wasn't acceptable on the first try, because we felt it was a little softer than it should be due to the amount of diffusion we used. I was trying to match the atmospheric quality of the haze in the bar and the amount of diffusion I had to put on that subject in the background bloomed my matte out. I can usually get two or three takes a week on a shot, depending on what I have to do."

Maintaining the special

look of each character became second nature once they were established, Jones discovered. "Once I honed in on the look of Jessica – of her density as far as the colors and tone on her are concerned – it was much simpler. I wasn't really satisfied with Roger, but finally it began to come together. We saw one comp of Roger at the window shade that was great. That's the look I decided to use and try to start matching it to Roger, who most of the time is in the scenes with Hoskins.

"Some of it was more fun because we were dealing with Toon colors and not having to match it to reality. Then we could go towards the crazy side. But we didn't want to overpower the reality too much; there is a balance. Once you're halfway through the film you believe that the Toons co-exist with the characters. It's like the first *Star Wars*, with the big ship coming over the top of the frame: you were there."

It's fun and it's fascinating, certainly. Yet, as Jones noted, the amount of effort required is staggering:

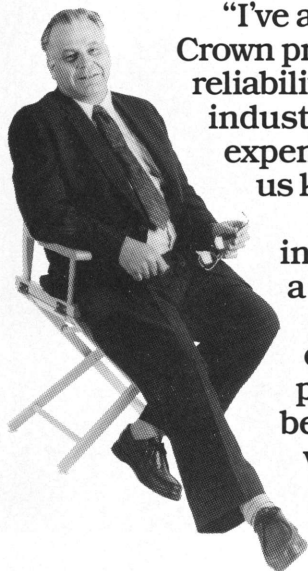
"About 20 optical people were working on this, around the clock, two shifts at 10 hours apiece, and there was lots of overtime. There's no pressure like what we've had on this show. Fortunately, I have a great crew and we've been through this many times. They keep saying, 'I'm only working six days, I can do more.' They know it's very special."

Ralston also commented on the rush toward deadline. "We'll probably be working right up to the last minute. I'm sure we'll be splicing in those last elements on the first of June, even though they want to get about 40 70mm prints out – and they take a day each to do. But that's a battle still to be fought."

He also hit upon a fact that every good visual effects artist knows:

"What's nice about it is that Bob Zemeckis knows that technique isn't why you make a movie. The technique is flawless because the movie and the characters have to come through – that's the whole point of it." △

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Sculpted Dolphins Swim Through *Splash*, Too

by Ron Magid

It seems that many effects artists these days tend to specialize, not necessarily by choice, but because they happen to be particularly gifted in designing one type of gag. Some create mainly monsters, others apes. Donald Pennington may go down in history as "the Dolphin man" simply because he's had the opportunity to bring these agreeable creatures to convincing life more times than you can shake a flipper. Pennington's dolphins passed for the real thing in such visible films as *Cocoon* and *Where The River Runs Black*, but they had their greatest exposure ever, in Disney's *Splash, Too*, which aired on television in May.

Though Pennington's approach to creating dolphin effects hasn't changed that much since he

first entered the field with *Cocoon*, he feels that with each generation his dolphins are getting better. "These dolphins are smaller than the ones I made for *Cocoon*," Pennington says. "Although we sculpted them the same way, used the same tooling and construction techniques, this time I've refined them even further. The dolphins are considerably lighter and their mechanics are much better simply because of all the experience. This is the third time around for me, and everything worked super."

For *Splash, Too*, Pennington was asked to make three mechanical dolphins to double for the two live dolphin stars. "We made one 7½ footer with limited articulation as well as a close-up upper

body of the same animal that was fully articulated," Pennington explains. "We also made a 3-foot 'fresh born' size to match to the live baby dolphin they had at the Dolphin Research Institute in the Florida Keys."

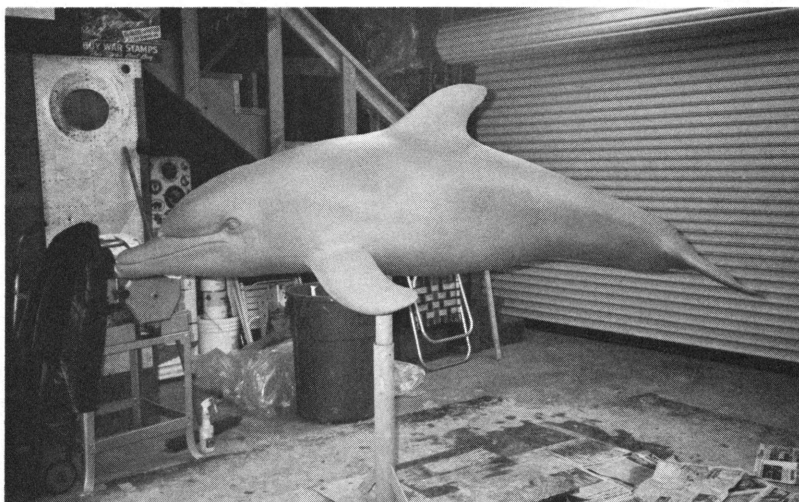
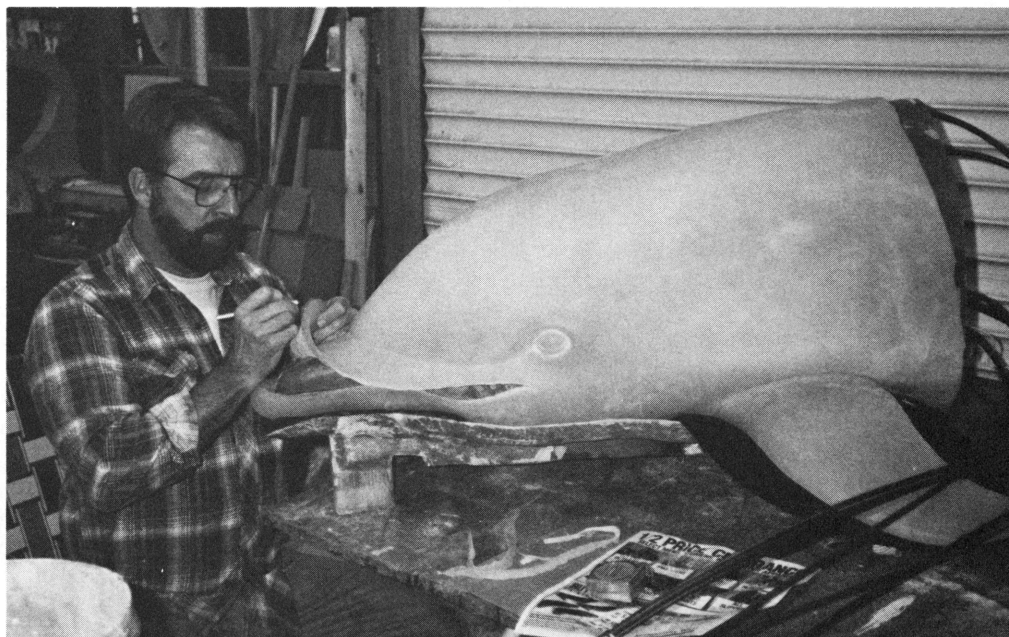
One of the major challenges Pennington faced on *Splash, Too*, which set this project aside from both *Cocoon* and *Where The River Runs Black*, was that the artificial dolphins had to match exactly to the live dolphins they were supposed to double. "We didn't have to match anything in either of the other films," Pennington affirms, "but in *Splash, Too*, our dolphins had to match exactly to the real thing because they might be seen side by side in interconnecting shots. In order to be as accurate as possible, I

asked Living Seas for a lot of reference photos of each of the dolphins. Unfortunately, the ones they sent didn't show the complete bodies from both sides and from top and bottom. We did our best with what they sent to match the shapes and all the predominant markings on each of the real dolphins to our own."

Once the photos of the real dolphins were in hand, Pennington and his sculptors, Tom Prosser and Leo Ryn, began the arduous task of recreating the animals in clay. Using two pound urethane foam cores, they cut and shaped the foam until it roughly matched the sizes and shapes of the dolphins they were to sculpt. The cores were then covered in wet clay and fine sculpted. Once the sculptures were perfected, lightweight fiberglass molds were made of each.

Pennington has always relied on BJB's Skinflex material from which to make his ultra-realistic, flexible dolphin skins, and he's never had a problem. Thanks to Los Angeles' record cold spell last December, which coincided exactly with Pennington's work schedule, getting the Skinflex to cure properly became an overriding consideration for the dolphin crew. "Those were some of the days that got really long," Pennington recalls with a shudder. "You have to have an ambient temperature of 70° (plus or minus 5°) for these chemicals to work properly, but when we were casting, we had ten days of temperatures in the low 20's! Even using space heaters and radiant propane heaters, at best we were pouring our chemicals in 50° temperatures. Consequently, we had very long cure times and some questionable cures. BJB gave us terrific support – the problem stemmed from the fact that we were really pushing the chemicals beyond their design capabilities."

Once the skins were finally cured, Pennington and his crew slipped them over fiberglass skeletons outfitted with Pennington's brand of no-nonsense, extremely simple mechanics. "I took my usual low-tech approach," he says proudly, "using cables and levers.



Above: Pennington applies the Skinflex material. **Left:** The clay sculpture, from which the fiberglass molds are formed. **Opposite page:** The finished product.

For the close-up head movement, I used a gimbal, which had left and right, up and down motion. That head also had up and down jaw movement and a working blow hole! I was surprised and pleased with the fact that BJB's new 615 Skinflex allowed our mechanics to work even smoother than before – from center, we had six to eight inches of left and right travel for the head, which made for a much more believable dolphin."

The full sized 7½ foot dolphin was needed only for shots where it would be carried on land in a sling, so it required a much simpler, but equally ingenious, system of mechanization. "It just had to have a flexibility to its entire body so it would move like a living

dolphin when it was in the sling," Pennington says. "The body was hinged in a number of places, and I put bungee cords and dense foam at each hinge so as the head fell to one side, for example, it wouldn't just flop down, it would snap back up. The foam and bungee cords acted as a shock absorber that would compress and then release. That way the head had a natural up and down movement to it as the body was carried."

Aiding Pennington with the mechanics were Jim McGeachy and Mark Noel, while Tony Cope served as production assistant. "Jim was the general all-rounder," Pennington points out. "He helped with the tooling, the casting, the assembly and the mechanics. Mark

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Noel really helped me out on the mechanical head. I gave him a design for the head, which he had some input on, and then he made it exactly the way I wanted it. It worked perfectly and nothing broke."

Pennington's crew was really put to the test because of *Splash, Too's* grueling four week effects schedule. "I made almost as many dolphins for *Splash, Too* as I did for *Cocoon*," Pennington recalls "but on *Cocoon*, I had 12 weeks. Trying to do this stuff in one-third the time made for a lot of really long days, and by the fourth week, we were all dragging. To make matters worse, we started this project on the 9th of December and we had to deliver on the 11th of January."

Once the dolphins were assembled, they had to be painted to match exactly their live counterparts at the Living Seas in Florida. Using the same photographs they followed to sculpt the dolphins in the first place, the crew attempted to incorporate as many of the predominant markings as they could glean from the scanty photographic record. Ron Gress was the painter who made the final come-to-life touches appear. "Each dolphin was very differently marked," Pennington explains. "In addition to various scars and sores, they all have really pretty white, grey and black 'speed lines' - at least, that's what I call them. It's almost like pinstripping that comes down their foreheads and turns back towards their eyes. One of the dolphins had a big sore on his mouth, which we painted into ours, but by the time we were ready to shoot, the sore had healed. Fortunately, the scar was still there and, thanks to the color difference in the photos we got, our sore matched almost perfectly in color to the real dolphin's scar!"

Once Pennington's crew finished the dolphins, they packed them into customized, cushioned fiberglass carrying cases and shipped them off to Florida along with Pennington himself, who went along to supervise the effects. That's when Pennington really began to earn his salary! "Although these dolphins didn't differ me-

chanically from those I made for *Where The River Runs Black*," he says, "the ones in *Splash, Too* were a little bigger because the species of dolphin was bigger - in the earlier film, the dolphins were six footers, here they were almost eight, so I had to deal with the logistics of working with something that was bigger. I forgot what a problem it can be when you're underwater trying to manhandle something that weighs 45 pounds empty. Once the thing gets filled with water, you have that much more weight to move around, and it's over your head! It became very heavy and difficult for me to move around, but the film crew never knew it!"

In fact, Pennington found dealing with the director, Greg Antonacci, and his crew a pleasant and creative process. "The director was very willing to listen to my suggestions," he enthused, "and I found him very agreeable. For example, there was a scene where they were using a dolly to lift the dolphin out of the water, and the director wanted to use our full sized, unmechanized model. I said, 'It's going to look like a big, inanimate phoney dolphin flopping down on a dolly, but if you cut it tighter to just show the head plopping down, we'll be able to articulate everything.' So the director cheated the angle a bit, and he ended up with a dolphin that was capable of up and down and sideways movements and blowhole action that performed as it fell onto the dolly. It worked so much better."

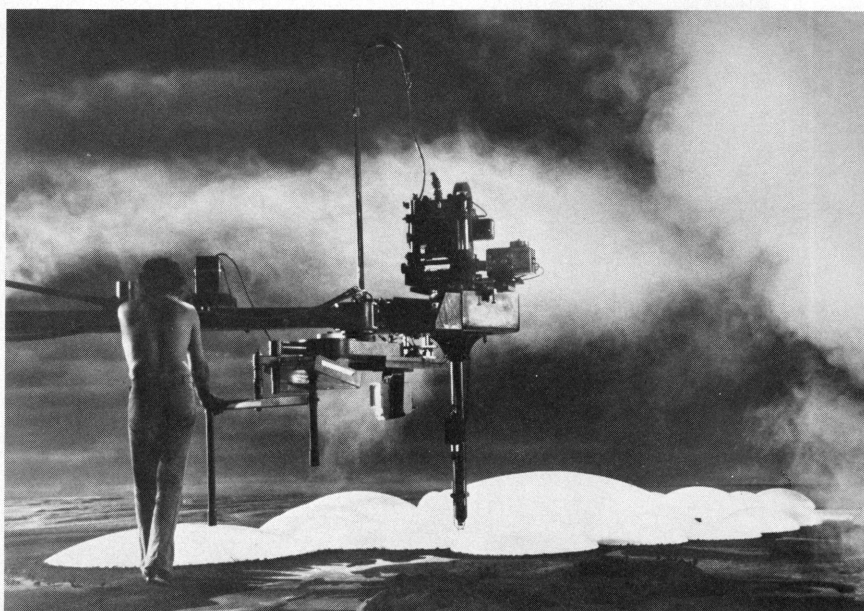
Although Pennington helped create the mermaid's tail for the original *Splash*, he had his hands full making dolphins for the sequel and the chore fell to Thom Shouse, whom Pennington worked with on the first film. Pennington did end up creating a post-production transformation gag to suggest that *Splash, Too's* mermaid, in human disguise, was reverting to her natural state after her boyfriend spills a glass of water in her lap at a restaurant. "The only parts of the girl's anatomy you can see are her thighs below her skirt up to the point where they vanish underneath the tablecloth," he explains.

"So we only made that much of her able to transform. We first did an actual casting of her legs to get a true proportionate size, and then we sculpted thousands of large, deep scales on top of her legs – they were much larger than those on the tail because it needed that kind of detail or else the effect would be lost on camera. We cast the scale section of her legs in fiberglass, and we had a double chamber underneath for the vacuum. We probably drilled about 2,000 holes in the fiberglass piece in order to get effective evacuation. We then fitted a balloon rubber skin over the scales to create the illusion of a flat, skin like surface. When we turned the vacuum on, it drew the latex skin down over the fiberglass piece which made it appear as if her skin had transformed to scales. At the same time, two fins slowly rotated up on either side of her legs – one was operated by me using a fin on the end of a puppet stick and the other was raised into place by Dave Atherton's hand. They looked as if they were actually growing and stretching, though in actuality, we just raised them up and let them quiver a little bit! As soon as the actress pulled the tablecloth over the phoney legs to hide them, we pulled our fins out of the way and that was the end of the gag."

Although Pennington's talents as a special effects artist extend well beyond his ability to make incredibly realistic dolphins on a reasonable budget, he speculates that one of the reasons he may keep being offered these jobs is because of his natural affinity for these intelligent sea mammals. "I just love them!", he exclaims, "I can't wait to get into the water with them. Fortunately, people recognize that I have a good working relationship with these animals and they feel comfortable letting me help them on some limited level. I feel really honored – it's one of the exceptional joys of being in the right place at the right time to be able to work with live dolphins. I never thought I'd get the opportunity to do it a second and a third time, and I can't imagine there'll be a fourth – but I hope there is. It'll be a treat!" △

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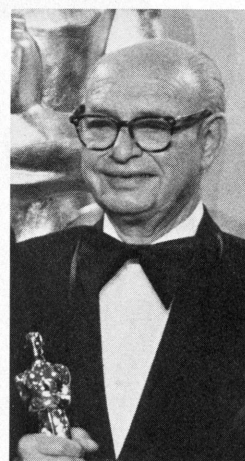


(Photo is of Kenworthy Snorkel Camera in use on "Logan's Run")

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The late L. B. "Bill" Abbott, ASC, originated many of the illusions that made movie special effects plausible. He began when the movie business was young, was long-time chief of special effects at 20th Century-Fox, and completed a brilliant career in the '80s. His legacy is this book, which tells how a flying saucer was landed in the heart of Washington, D.C.; Paul Newman and Robert Redford leapt 80 feet into a rocky creek; the world's tallest building was destroyed; Raquel

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Flying Saucers for *Batteries Not Included*

by Ron Magid

It is the quintessential Spielberg production: a family of flying saucers come to Earth, befriend a group of destitute geriatrics and, with a little bit of outer space hocus focus, save the day for their human allies in their fight against the evil land baron who plans to raze their tenement home. Sounds simple. Well, *Batteries Not Included* may have been just that from a story point of view, but when it came time to devise the elaborate spaceship gags on which the whole production hung, the problems were anything but simplistic.

The man who probably sprouted more gray hairs than anyone during the course of *Batteries' Not Included* lengthy preproduction, production and post-production schedule was

effects supervisor Bruce Nicholson. It was Nicholson's task to integrate the effects believably into the fabric of the film, where they often were required to play off live actors. Accomplishing this chore meant utilizing every known form of animation technique, including wires, rod-puppetry and stop motion animation. New variations were created that boosted *Batteries'* reality and which will subsequently benefit future effects films. "It was a tough challenge to combine our effects with this very real, depressed environment," he explains. "Normally, we deal with fantasy environments, so *Batteries Not Included* required an unusual blend of ingredients."

One of the most unusual

aspects of this unusual production is that the flying saucer miniatures were exactly the same size in reality as they appeared in the film: Ma and Pa saucer were each about a foot in diameter, while babies, Flotsom, Jetsom and Weems measured barely three inches across. "I considered working in a 1:1 scale a real advantage," Nicholson says, "because it allowed us to do some of our work on the set. Difficult post-production effects such as shadows and interactive light would already be taken care of in these shots."

While handling effects in 1:1 scale was undoubtedly helpful for the talented teams of animators, matte artists and optical people who worked on the film, it put a

real strain on modelmakers Greg Jein, Paul Huston and Lorne Peterson, as well as mechanical effects supervisor Tad Krzanowski. Making the models themselves wasn't that difficult, but making them work was.

Greg Jein's beautifully crafted light sculpture "mother-ship" was the centerpiece of Steven Spielberg's *Close Encounters Of The Third Kind*. Jein's subsequent work on projects as diverse as the neon casino signs for Coppola's *One From The Heart*, and the brilliant recreation of Hollywood Boulevard for *1941*, has forever assured him a respected place in the hearts of moviegoers everywhere. On *Batteries Not Included*, Jein characterizes his involvement this way: "My basic job was making the kid ships and being their 'wrangler' on the set." In fact, Jein's involvement spanned five months of pre-production plus shooting, during which time he supervised and/or built some 50 prototypes of the baby ships before Ralph McQuarrie's and Paul Huston's designs were locked down.

Once the final designs of Flotsom, Jetsom and Weems were settled upon, Jein had patterns made. The patterns were then molded, so that the kid ships could be manufactured as quickly as possible. Since they were to be used on the set as often as off, he felt the casualty rate among the baby saucers would be high. He was right. "We built as much of the detail into the patterns we molded as possible, so we didn't have to add too much to them," Jein says. "The finer detail pieces we did add were taken from existing plastic model kits. The process of casting the basic bodies took about twenty-four hours, but assembling the ships went about as fast as you could put one together, although it took longer to build the guts for them. We had to have several versions of each, some for stop motion, some for rod puppetry and some for flying harnesses."

Being crunched under-foot or dropped was the fate of most of the kid ships. Jein recalls an amusing incident where a ship met a different end. "There was a scene

in which one of the puppets was supposed to swim about in a bowl of hot soup," he remembers. "Someone actually heated the soup, and when they put the puppet in, it melted! Fortunately, we had another puppet on hand in case something horrible happened. After that, they put our standby ship in cold soup and it worked out fine."

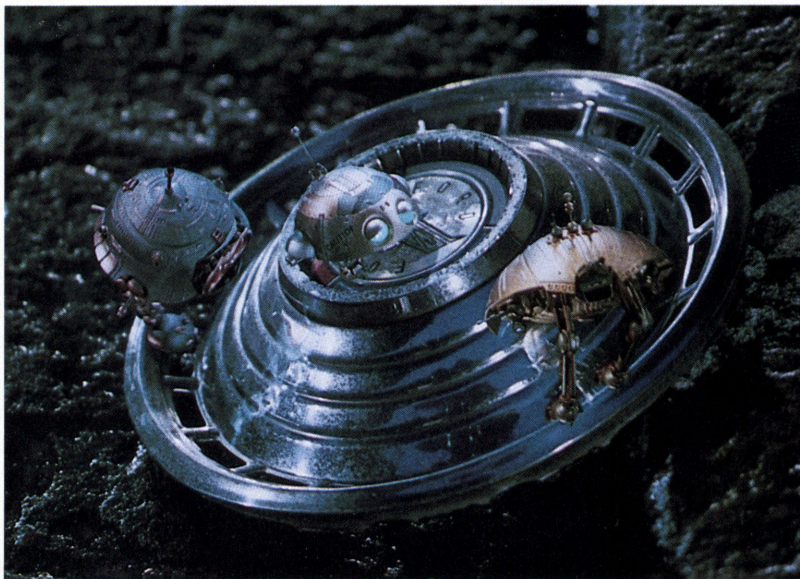
One of Jein's many thankless tasks was to make working eyes for the baby ships. "A lot of research went into developing different kinds of eye looks," he says. "We did one variation where each eye had a little lit pupil, but that was rejected after we shot with them for two weeks because they felt the eyes were a bit too comical. The final eyes utilized a six point LED, so it looked like there were a bunch of tiny lights instead of a single light source."

Jein also made a number of unusual miniatures and rigs for various sequences in the film. These included a series of five replacement animation arms for one of the kid ships, a support base for the three babies that would fit into the crook of an actor's arm, and a hamburger bun complete with melted cheese for a scene in which Jetsom is mistaken for a burger by a chef. "The chef drops some cheese and a bun on her, at which point she looks like a hamburger with legs," Jein laughs. "They did many

takes dropping a real piece of cheese onto her as she ran around in front of a bluescreen. For the shot after the cheese had landed, I made a piece of cheese out of plastic which I carefully melted around her by hand so it would have an 'artistic' look! For the bun, I took a real hamburger bun and dried it out for a week so it wouldn't wiggle."

Because of delays in the production schedule, stop motion animator Dave Allen found himself up at ILM with nothing to occupy his time, so he assisted both Jein and Tad Krzanowski in designing armatures for the spaceships. "I made all the baby armatures," Allen notes, "which were really just legs. I could say I designed the little legs for Weems - which would sound good and which is true - but really, I just made them as small as I possibly could and that was the design! The feet were bigger, and Greg Jein helped with those. I also worked with Rodney Morgan making the complicated stop-motion animation legs for the Ma saucer to walk around on, although we also filmed things in the rod puppet mode. The puppet could be used either way just by tightening or loosening the joints. That paid off because we always knew we had the option."

The elaborately detailed Ma and Pa saucers were built by Lorne and Paul Huston with help



Opposite page:
Baby saucers, searching for Mom nestle up to hub-cap. Blue screening these metallic space ships was made more difficult because of their sheen. Left: Hume Cronyn, about to be visited from outer space. (Frame blow-ups from the film)

Top: Greg Jein displays prototype of rod puppet. Center: Lorne Peterson at work on interior mechanism for 'Pa' saucer. Below: Tom St. Amand adjusts model for saucer animation.



Photos by Kerry Nordquist and Roberto McGrath

from Jein. Hidden in the ships were some compact, complex electronics devised by mechanical effects supervisor Krzanowski. Assisted by Marty Brenneis, Nick Esposito, Mark Thorpe, Jeff Wilkins and Scott McNamara, Krzanowski had the unenviable task of fitting eight pounds of gadgetry into a one inch diameter package. "The models had to be compact and self-contained – even the batteries had to be inside, as well as several miniature radio control servo motors and an eight channel receiver!" Krzanowski explains. "Ma's eyebrows had to be able to move up and down, and the eyes had to be expressive – look side to side, rotate and blink – and both of them had to have detachable appendages that worked with the internal mechanism of each ship. Consequently, each model was loaded with very complicated machinery and electronics."

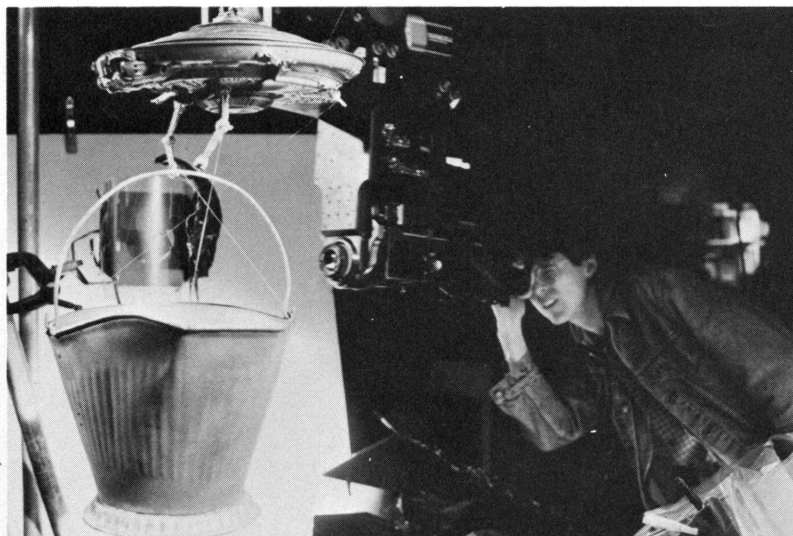
To simplify matters for the animators and radio control operators, Krzanowski devised a method whereby the same ship model could be used for sequences in which special arms were employed. "Instead of building two sets of models, one with attached arms and the other without, I gave all of them the potential of having arms attached," he declares proudly. "Each arm had a little bracket with gears so that when we put it into the model, the gears matched to the rack and pinion assembly inside, which allows the arm to open, close and move."

Furthermore, all five copies made of each of the Ma and Pa ships could be animated on wires and on rods, in addition to being stop motion puppeted. "Rods could be attached from underneath and from either side, and wires could be hung from above or below," Krzanowski recalls. "It only took five or ten minutes to switch from one mode to the other, so it could all be done right on set. It was a lot of effort to incorporate all of these features into each model, but it paid off when we shot on the floor – we never kept hundreds of people waiting for hours."

Krzanowski's greatest contribution to *Batteries Not Included* is an innovation so simple yet so effective, it won a technical award from the Academy of Motion Pictures. Essentially a radio controlled marionetting system for spaceship miniatures, the hidden wire rig replaces the need for rods in such cases, and allows the model to pitch, roll and rotate simultaneously – an effect never before achievable in motion control or live situations.

Though Krzanowski had conceived of the idea for the hidden wire rig before he came to work on *Batteries Not Included*, it was the unusual parameters of this film that provided the impetus for the inventor to finally make his idea a reality. "Matthew Robbins, the director, wanted something that was more real than motion control," Krzanowski recalls. "He wanted to be able to fly the saucers on the set. I'd done miniature flying effects for *Superman* and a number of the Bond films – in fact, most of the movies I've worked on required some flying effects – so I had a long time to think about this rig. The rig I had in mind involved a master mechanism from which the model would be suspended by wires, so whatever you did with the master, the slave would repeat."

Robbins wanted the flying saucers to be able to move in abrupt, jerky motions in any direction, which meant that Krzanowski's rig had to be extremely stable, yet responsive. Using the director's demands as his guide, Krzanowski re-engineered his original design to fit the specifications of *Batteries Not Included*. "I used a system of nine wires coming from three points on a swash plate above the model, which then attached to the model in three points," Krzanowski explains. "Each of the three wires emanating from a single spot on the swash plate attached to a single spot on the model, but they first passed over a 'star' with nine arms, one for each wire, so the wires would cross over each other and provide stability. The rigs from the swash plate to the star and from the



Left: Motion control operator Peter Daulton checks model action.

star to the model are mirror images of each other. It's very elaborate, but if we didn't separate the wires with the star and had allowed the wires to remain parallel instead, the model wouldn't have been stable."

The criss-crossed wires also defied detection by sharp audience members, though to be sure, Nicholson insisted the wires be painted to match whatever environment the ships were flying through.

While the rig itself was driven by stepper motors to accomplish pitch, roll and rotational movements, for actual flying, the rig was attached to a Barber boom arm or a Chapman dolly. "Most of the flying motions were created with boom swing," Nicholson says. "We tried to avoid using dolly movement as much as possible because the vibration was critical. If there were any bumps in the floor under the dolly, the model would jiggle. It was a delicate situation."

Once the on-set flying problems were licked, the greatest challenge facing Nicholson in post-production was to match the motion control flying with that of the hidden wire rig. The solution was remarkably simple. "I decided to use the wire rig in post-production as a motion control marionetting device," Nicholson says. "We simply set the rig up on our stage with a blue screen behind it. Because the rig was stepper motor driven, we could interface it with our motion

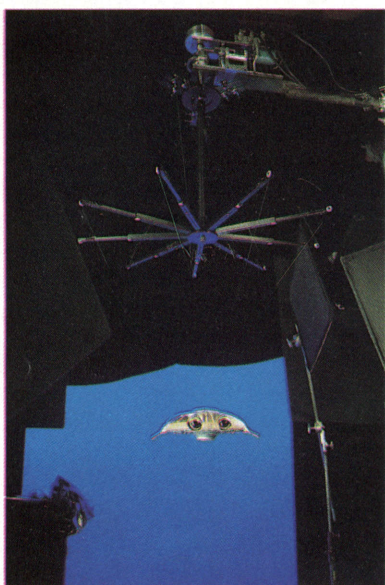
control system and program movements that way, which gave us the continuity we needed in matching action."

Nicholson and Krzanowski didn't realize the motion control potential of the hidden wire rig until just before entering the post-production phase of the film. "It was something that just happened," Krzanowski admits. "We really designed the rig for real-time, but when it came time to do our motion control photography, I thought we should try to incorporate the rig."

"As it turned out, using the rig offered tremendous advantages to us in motion control work that we didn't realize at the time. Normally, when we rod mount a model, we can't program three axes simultaneously – with the wire rig, we can. This enabled us to do our shots a lot faster because usually, the motion control camera operator has to use camera movement to simulate one of those axes."

"Additionally, the rig enabled us to do less rotoscoping because the wires were so thin, they could usually be rendered invisible. We painted the wires with a black indigo ink, and the blue light from the blue screen would just wrap around them. It's sometimes impossible to blue out rods that support a model, so we have to articulate matte them out. Even using the wire rig, we still had to make garbage mattes to keep the

The rod puppet crew – Tad Krzanowski, Greg Jein, Bob Cooper and David Allen – animate two puppets for studio sequence. Below: The “wire rig” with a saucer suspended from it.



blue to a minimal area so we'd get less spill and veiling on our model, but that's a much faster technique than articulate mattes."

Surprisingly, a number of stop motion animated shots were handled during production on the same live action sets used by the actors. For the "flying lesson" sequence, animators Allen and Tom St. Amand had to clear the stairway set in order to puppet the baby spaceship's vain attempts to avoid learning to fly. "That sequence combined stop motion, go motion and motion control," Nicholson says. "It was almost like working on 'LooneyToons' as we improvised our way through the sequence using the storyboards as

reference. It was very spontaneous, it worked great and it was a lot of fun."

After 20 years of stop motion animation on films as diverse as the low budget *The Day Time Ended*, and multi-million dollar extravaganzas such as Lucasfilm's upcoming *Willow*, Dave Allen has at last become a "name" effects artist. The laconic Allen takes such recognition in stride, preferring to concentrate on the challenges of each new production. "Normally, there's a pretty clear distinction between production and post-production, but not on this film. I was pretty happy with how it went. It was a daring approach that appealed to the non-specialist in me – I was able to come in like the country doctor and do the whole operation right in place, which is not normally how something like this would be handled at ILM. Actually, the main problem involved scheduling so the live action unit wouldn't require that side of the stage while we were animating!"

Allen primarily puppeted the Ma saucer during the "flying lesson," while St. Amand handled most of the gags in post production as the baby saucer first sprouts wings, then a parachute and finally a parasol in an attempt to break its fall. "I animated both shots where the Ma saucer produces a saw and cuts away the side of the stairs where the baby saucer is hanging on – the shot where she starts the

cut and the one where she finishes it," Allen recalls. "I also animated the shot where the saucer drops down. For the first ten frames or so, as he crashes up against the side of the stairs, I devised a little pulley system to suspend him from so that as the camera rolled over, I could just lower him down a little bit at a time, so he'd have a more natural blur. After that, it was the old Willis O'Brien type stuff."

"As the baby fell, St. Amand used a series of photo cut-outs of the staircase set as the background, which were being recycled behind the puppet. In order to keep the background going long enough for all the action to take place, I bet it probably took a 12 story apartment house instead of the three story building it's supposed to be!" For the parasol gag, Jein built a special miniature umbrella for St. Amand out of aluminum. The parasol was designed to first unfurl, then catch the breeze and then blow inside out, just as in a cartoon!"

Allen's primary role on *Batteries* was handling the numerous rod mounted puppet shots in front of blue screen. This technique, though far less stressful than ordinary stop motion animation, still makes plenty of demands on the animators. "We did about 50 such elements," Nicholson remembers, "all against blue on mirrorplex floors. The mirrorplex is mylar-backed plexiglass which reflects the blue light under the models. We'd cut little slots in the mirrorplex that corresponded to the path the puppets were to take in each scene. Once the path had been selected and the slots cut, we'd rehearse with two puppeteers. One puppeteer handled the rod that came off the head of the puppet and controlled body movement, while the other one worked underneath the mirrorplex floor manipulating rods attached to each foot. We used a video assist so each puppeteer could see what the other was doing. Everything was on a stop watch, each mark had to be hit at a precise moment, and the puppeteers had to be perfectly coordinated, so the whole process became

pretty involved. We'd shoot on film and record the move simultaneously on tape, which we played back to see what we got. Sometimes we'd do as many as 50 takes, but they could all be done in a day. It was exhausting, but that's the advantage of rod puppetry over stop motion."

"It's much less stressful," Allen agrees. "You don't feel that low grade paranoia hanging over the process, unlike in stop motion, where you may find after a day of work that everything has got to be done over and all of your concentration has to be psyched up once more. With rod puppetry, you usually do several takes a day and if you have to do it all over again, you don't feel like all your energy had been discharged by the animation process, which is very draining. Fortunately, I didn't have to redo any of my animated sequences from *Batteries*."

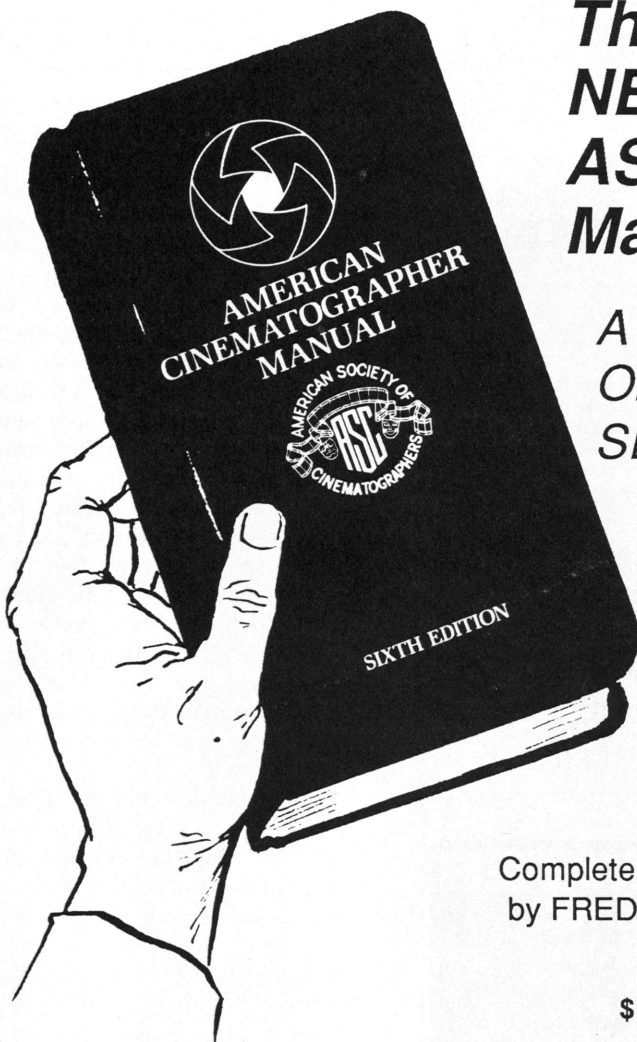
The battle in the cellar is more of an attack by an axe-wielding human on an unsuspecting Pa saucer, who flies against a wall, crashes onto a stovetop, limps across the stove and finally falls in a battered heap to the floor. Though the shot in which the saucer is hit by the axe was motion controlled, most of the other shots in the sequence were live, and required quite an effort on the part of the on-set model wranglers.

"Although our damaged Pa saucer was designed to be thrown on top of the stove, things got a little more complicated than we anticipated because they wanted it to hit the wall a certain way and then land on the stove a certain way," admits Jein. "It was difficult to toss this thing onto the set and get it to face the right way, because we were basically just throwing it from out of camera range. At first, we tried shooting it onto the set with an air cannon, but it didn't look quite right - it didn't have the right force or trajectory. Eventually, one of our guys threw it on the set a couple of times, but that didn't work because it was supposed to hit a certain spot, knock over a certain thing and then fall right side up facing the right way! Finally, Joe

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Johnston got a little frustrated and said, 'Let me do it!' and got it on the first take! Prior to this, we'd gone six or seven takes, so the model was pretty trashed. Fortunately, we had a lot of hot glue in the back room, so we just kept putting it back together until they got what they wanted on film!

"For the next scene, which showed the wrecked Pa saucer crawling along the edge of the stove," Jein continues, "we used the same wrecked model we tossed on the set - we glued it together yet again - and Tad Krzanowski added a remote controlled arm to it so it actually looked as if it was dragging itself along. Tad built the arm and our crew detailed it. It took a bunch of people to operate because it had to lift the saucer up and crawl and, at the same time, we had to cue pyrotechnics for the little sparks it was giving off. Ken Pepiot, who handled all the pyrotechnics for the show, basically used squibs with lots of wires that camouflaged themselves with the other debris in Pa's 'wounds'."

Oddly enough, since all of the saucers were either built exactly to the size they were to appear to be in the film or double that size for specific effects sequences, the only real "miniature" in *Batteries Not Included* was a L'Eggs billboard sign ILM matted into Times Square, for a sequence when the baby saucers first venture into the heart of New York. The shot follows the babies as they fly past the sign, and was built onto a live action swish pan move of Times Square recorded on the Tondreau System field recorder. This device, first used at ILM on *The Golden Child*, allows any move recorded in the field to be duplicated on the motion control stage. In this way, the camera seems to swish pan with the saucers as they fly by the miniature billboard.

"This shot required a lot of passes," effects supervisor Nicholson relates. "We used rear-illuminated gels in our 1/8 scale, 6'x10' billboard model, to simulate neon lights, and I needed to extract a matte for each primary color.

There was a red and yellow pass, and a matte pass for the whole sign. We also added passes for the miniature buildings we placed around it and for the miniature lights in those buildings, and a pass for a puppet of actor Frank McRae who is seen standing on the sign. Then we added enhancements with light onto some of the 3-D surfaces. Since each of these passes had to be cued into the basic swish pan move recorded in New York, this became a big test for the Tondreau System."

Plotting in all of the separate passes in that shot was *Batteries'* optical supervisor John Ellis, who found his load relatively light on this project. The only real problem Ellis had with the billboard shot, for example, was that the pan shot in New York wasn't quite right to begin with: "The original pan wasn't that smooth, so we optically removed the bumps. That was a bit difficult."

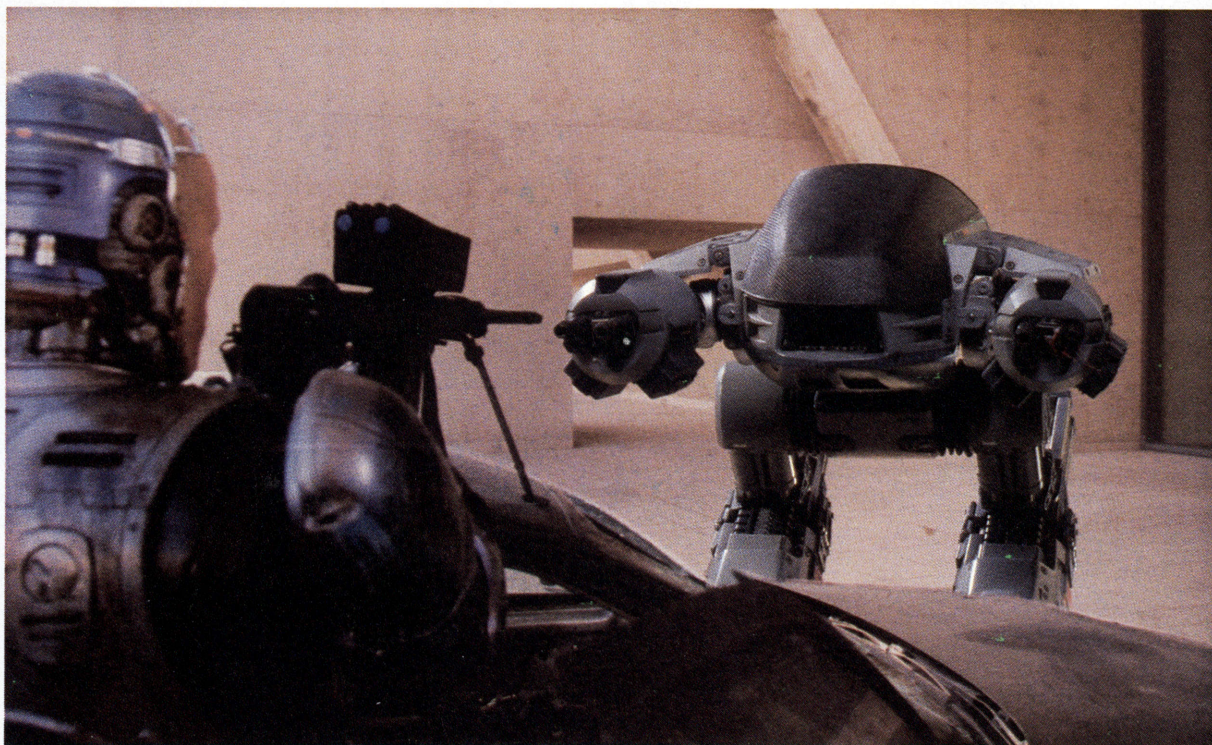
The only other difficulties that plagued optical throughout the post-production process was dealing with the color and reflective properties of the ships. "The colors of the saucers ranged from copper to gold," Ellis says, "which made it difficult for us as far as the blue screen edges went - we had to come back occasionally and do a blue spill mask to keep the light from spilling onto the model. Also, because we're limited to certain colors in blue screen work, we had a bit of trouble with the color range of the ships.

"There's a little bit of just about every type of effect in *Batteries Not Included*," Ellis concludes. We had to composite a lot of marvelous animated shadows and interactive light. When all the elements finally came together, it really was impressive."

Aside from its state-of-the-art usage of such newfangled effects tricks as motion control and radio control, many of the most successful effects moments in *Batteries Not Included* were actually rather low-tech. In fact, most of the trickery was handled, in the old-fashioned conjurer's parlance, with wires and mirrors. △

Tried and True Style for *Robocop*

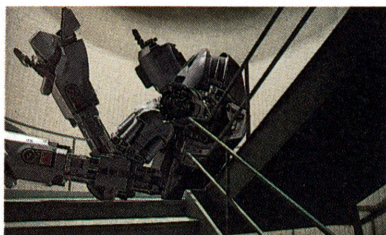
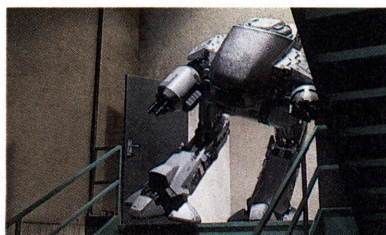
by Ron Magid



Left: Miniature Edd 209 with Robocop and rear projection. Center: Edd 209 in miniature set, built by Craig Davies. Below: Stairwell sequence (miniature).

Phil Tippett's exceptional stop motion work for the low budget mega-hit *Robocop* was a most welcome surprise to the visual effects assemblage of 1987. Working on an extremely tight budget and time schedule with long term Industrial Light And Magic cronies Harry Walton, Randy Dutra and Tom St. Amand, Tippett managed to create the menacing character of Robocop's nemesis, the Edd 209 robot, in true quick and clean Ray Harryhausen style by animating his puppet against a rear screen projected background, which saved on costly and time consuming compositing.

Tippett emphasizes credit to director Paul Verhoeven, who insisted that each of the effects shots be incorporated into the film in the most dramatic way possible. The advantage Tippett's fast and



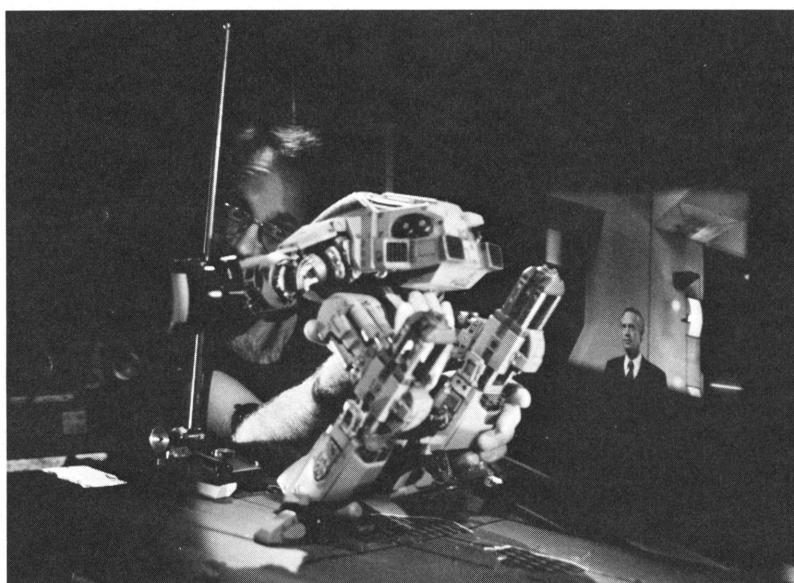
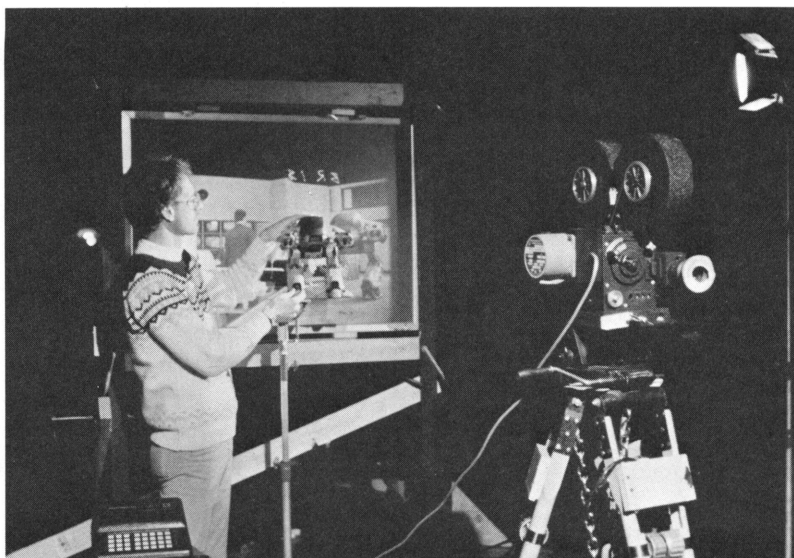
spontaneous animation work for *Robocop* has over the cleaner, more refined work of his competition is that every shot he made works entirely in the service of the story.

"You can do the best work

in the world, but if it's in a bad film, who cares?" Tippett explains. "I would even go so far as to say you can do sub-standard work in the service of a good idea told with dynamic and kinetic filmmaking. The best thing about our work on *Robocop* was that as a result of a stringent budget, we had to work very quickly and everything we did had to work the first time and that was it, we had to move on. It's a different way of working, but I think it's the real way of working. Special effects shots tend to be relegated to second unit directors, but Paul stayed with us, making sure that every scene was shot with the right kind of dramatic impact. It's a different kind of sleight of hand. It's not the apogee of special effects work, but it is of movie making."

Verhoeven's willingness to participate in a project called Ro-

Top: Harry Walton sets up sequence. Below: Miniature Edd with animator Randy Dutra.



bocop inspired Tippett and his crew, who were fans of the Dutch cult director's other films, which include *Spetters*, *Soldier Of Orange* and *The 4th Man*. Verhoeven became a galvanizing force in the making of the film, inspiring everyone involved to do better work than the budget would allow. "He was the guy who really made it all work," Tippett says admiringly, "because he made it clear that he wouldn't accept junk, which is all that we felt we could deliver since we were locked into such a low budget. Paul said, 'If it's not believable, if it's not realistic, then it'll be laughed off the screen.'"

To solve the paradox of getting great looking effects on-

screen with no money, Tippett re-examined the methods of stop motion animation legend Ray Harryhausen, who has successfully balanced art and commerce in partnership with producer Charles Schneer for almost three decades. "It was quite clear to my producer, John Davidson, that there had to be a cheap way of doing these effects, so I looked at the films Ray Harryhausen did with Charles Schneer and I realized that they ran everything through one system, one mill, and that's how they got more shots for less money," Tippett recalls. "I began to see that the way to go was to use rear screen composited stop motion just as Harryhausen used to do all of his shots."

This technique, in which the stop motion puppet is animated against a rear-projected background plate advanced one or two frames at a time, proved to be quite a time saver, but it also had the disadvantage of limiting the director's choice of set-ups, because actors cannot cross in front of the puppet, they can only move behind it or off to one side. "Fortunately, Paul was willing to sit down with me and talk about what he wanted for each sequence. I started off by telling him all of the limitations of the rear screen stop motion process, and after about two hours of delineating all of what we couldn't do with it, we got involved in a more creative discussion about what we could do to overcome these limitations.

From the beginning, we knew we needed a full sized Edd 209 figure, and that became something we realized could be used to our advantage in terms of the animation. The solution was simple: we used stop motion for the ambulatory shots, but when we took the puppet to a power down situation where it would stop moving, we'd wheel in the full sized prop so we could have extended dialogue scenes and handle difficult live mechanical effects like the rocket blasts with the actors standing in front of it."

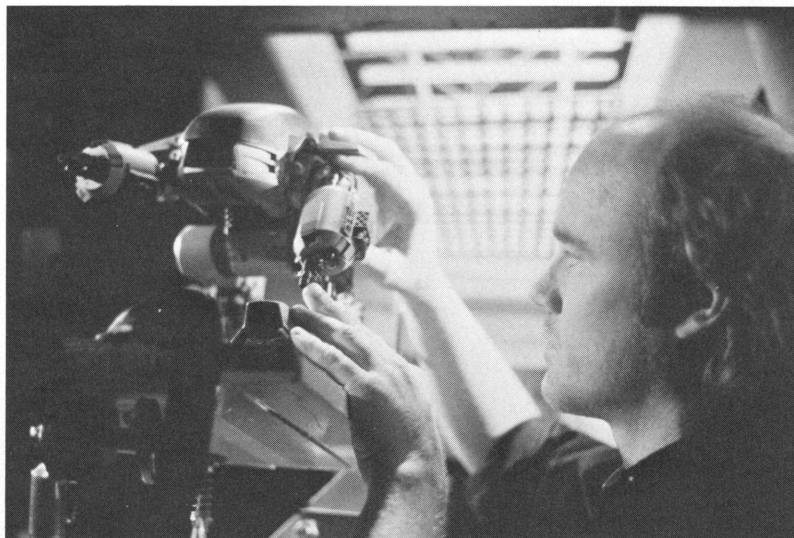
The man responsible for creating Edd 209's "dumb but powerful" look was a talented twenty-three-year-old named Craig Davies, who also built the full sized prop and the outer shell of the stop motion puppet. "Craig was singularly responsible for the look of Edd 209," Tippett says. "I have absolutely no sensibility when it comes to designing mechanical things. Craig worked closely with Verhoeven, who made it clear from the beginning that he wanted something shaped like a 'Z.' He wanted something that was completely un-anthropomorphic; he wanted a character who was Robocop's antithesis. Unlike Robocop, who was a man locked inside a metal body, Edd 209 was very hard and mechanical, with the precision of a lathe and the physical force of a

Mack truck. Paul and Craig worked together to make Edd harder and sharper while at the same time trying to make it feel like a real piece of hardware with certain design qualities that people would call sexy.

"Edd 209 was a piece of junk designed to kill people, but the corporation realized they were also making something they had to sell to other people, so it had to look nice and have certain attractive qualities! At the same time, they wanted it to look as if it was still in the prototype stage, so it was painted a neutral gray color and covered with warning stickers. Paul was very keen that Edd should have only the most vestigial face, so it looked blank and staring and dumb. Craig's solution to this anthropomorphic problem was to design air intakes in a certain configuration that looked like a mouth. They came together in a very simple truncated triangle that made a rudimentary facial expression."

The final showdown between Edd 209 and Robocop, beginning with Edd's ridiculous attempt to navigate a steep set of stairs as he pursues his bio-mechanical adversary, is a classic comic confrontation that is one of the highlights of 1987's special effects. As animated by Harry Walton, Randy Dutra and Tippet, this final sequence is a bravura bit of characterization and performance that clearly establishes Edd 209's great strength and inept weakness, while still carrying the film's story resolutely forward.

Of all the stop motion effects Tippet supervised for *Robocop*, Edd 209's disastrous tumble downstairs was the biggest worry – even before producer Davidson called Tippet and begged him for a laugh or two to lighten the grim tone of the film. "As the picture was coming together," Tippet relates, "the producers felt that it had too maniacal a mindset – it was getting very intense as people would swear at each other and blast their guns for 15 minutes at a time, and there was no relief from it. We had always wanted to do something funny with Edd in the stair-



Animator Tippet with Robocop enemy, Edd 209.

well battle, but before we could do that, we had to arrange his fall down the stairs, and I really had no idea how we were going to do it."

We shot background plates on the full sized stairwell set and I tried to figure out all these screwball ways to fly Edd down to simulate his fall. We were really getting down to the wire, we had to get the shot, so we took all the information available and built a great duplicate miniature set of the stairwell. Harry Walton placed the set at a 45° angle and tied the Edd 209 model down with a small pin in his foot that could be removed to let him fall down the stairs. Harry loosened all of Edd's joints and loaded him with lead so he had weight. Then he pulled the pin and let him fall downstairs. We shot it at about 75 frames per second. The only real trick was animating him into the fall and then getting him out of it at the end."

At the base of the stairs, the frustrated Edd 209 robot has a mechanical fit, which provides the first of several laughs the producers and filmmaker felt were necessary to help the audience through the film's last few moments. "Originally, we had done a couple of shots where Edd was lying at the base of the stairs kicking and he seemed to have a great deal of weight," Tippet says. "Then Paul said, 'Why make the movement project so much weight? Why not make him more like a mad bee or a baby?' At that point, we pulled out all the

stops. Harry Walton animated the shot where Edd flails in frustration, and he made him go pretty crazy. He went against all the rules we would normally follow to cap that sequence off with a touch of humor."

After Robocop fires a deadly barrage at Edd's head, one assumes that's the end of their battle. To add another bit of fun to the proceedings, Tippet arranged a low angle shot as Edd 209 walks into frame, apparently still stalking Robocop, only to have it stagger and fall into the shot, revealing that its head is completely gone. "I was initially going to handle that very matter of factly," Tippet admits, "but then one of the producers called and said the film had gotten too serious and we needed another laugh at this point. 'Make him look like he's drunk,' he said, so I took that idea and tried to make it look like he was out of control."

What has pleased Tippet so much was working on a film made by talented and dedicated professionals trying to do the best job possible.

"Watching our editor, Frank Uricose, assembling our animated footage, I got a feeling I haven't had in so many years," Tippet says. "I was seeing scenes I had worked on, and I suddenly got this sense of amazement and enthusiasm, and I realized that this was why I got into this business, to do that kind of stuff." △

W·I·L·L·O·W





by Ron Magid

The latest fantasy film from a seemingly inexhaustible imagination is *Willow*, a George Lucas film, ably directed by Ron Howard. Both these men are more than qualified for adventures in special effects, for which *Willow* is a grandiose showplace.

"The story, conceived by Lucas, is a period fantasy film that takes place in a world where there are lots of different beings: little people, fairies, nine-inch-tall Brownies, and even some humans.

Within this magical environment, *Willow*, one of the little people, must safeguard a baby, destined to become the good princess of the kingdom, from the evil queen," says Dennis Muren, whose leadership in the special effects of the film guided it all to fruition. Muren, a multiple Academy Award winning effects supervisor at San Rafael's Industrial Light and Magic, is one of three supervisors on *Willow*, a story set in a fairytale world like that of J.R.R. Tolkien's Middle Earth or the sagas of the Brothers Grimm.

"Ron Howard is a real good filmmaker who knows what

he wants, understands special effects and who contributed great ideas. George Lucas is a fountain of ideas and he and Ron worked out so much stuff that we didn't need to become quite as creatively involved as we have with other films, though they're certainly not against using other ideas. My energy on Lucas films goes into figuring out how we can get the stuff done and to make it look as good as it can."

Even as costly a film as *Willow*, because of its vast scope, must remain somewhat budget-conscious, a fact which Muren found very frustrating. Walt Disney's classic fairytale, *Darby O'Gill and the Little People*, was able to make extensive use of forced per-

Right: Maria Holvoe as the Faerie Queen is made to appear ethereal via complex optical techniques. Previous page: In this unusual matte shot, the sunrise is real, the mountains were painted by Paul Swendson, and the silhouetted Nelwyns were bi-packed into the foreground. Matte photography by Craig Barron.



spective effects over an extremely lengthy shooting schedule. Unlike *Darby*, Willow had to accomplish many of the same types of effects trickery on a limited schedule and budget.

"I would have loved the opportunity to do something like *Darby O'Gill*," Muren admits, "but there's no money to do that anymore – nobody would take the time to make it work. Today, we have to rush through production, give the director what he wants, shoot our plates quickly and then come back to a post-production environment and figure out how we're going to make things work."

"Near the beginning of the film," Muren explains, "Willow and Migosh are captured and tied up like Gulliver by the Brownies. Just as they're about to pull them into their lair, the Faerie Queen, a vaporous creature, appears, startling the Brownies. She floats down and tells Willow exactly what his mission is and gives him the magic wand that causes him so many misadventures throughout the film."

To achieve the effect of 20 nine-inch Brownies dragging Willow and Migosh across the clearing required careful planning. First, the original background plates had to be shot, in which the actors playing Willow (Warwick Davis) and Migosh (David Steinberg), were dragged through frame by invisible wires."

When shooting moved to the special blue stage ILM uses

near San Francisco Bay, the actors playing the Brownies were choreographed against a painted blue background for compositing into the scene. "The ropes coming off Willow's shoulders and legs are each pulled by five Brownies, so on stage, each of the five Brownie actors held onto a piece of real rope, except the last one, closest to Willow's body, who wasn't holding anything. A computer streak exposure added the matching piece of rope," Muren says. "Further enhancing things is the fact that the camera is panning in some of these shots, so there's some pretty bold stuff. As soon as you start moving the camera around, these shots become magic."

Lining the blue screen Brownies elements up with the live action movement of Willow and Migosh as they're being dragged across the clearing was one of the more difficult aspects of the Faerie Forest sequence, handled in optical by Kenneth Smith and John Ellis. "It was difficult," Ellis admits, "because there were a lot of motion-controlled match-moves. Some of the ropes also had to be added in animation and then pin-blocked and match-moved into the scene."

The hardest element to generate in this complex sequence was the character of Chirlindria, the Faerie Queen (Maria Holvoe). "She had to be a very beautiful, gaseous apparition that appears in the forest at night," Muren explains. "Ms. Holvoe is a wonderful

New York model who absolutely knows what she (the queen) looks like and who's great at posing. Aggie Rogers and Mick Backer made a lot of nice soft silk fabric pieces with which to drape her, and then we shot her on stage against black with filters that gave us a nice fog effect. It was George's idea to over-expose her about four stops and then to pump even more light on her so she looks burned out in the frame. We shot her at 48 frames per second, and since she's speaking the whole time, she had to act to double-speed playback.

"Kenneth Smith (who shared this year's *Innerspace* Oscar with Muren, Bill George and Harley Jessup) then took her footage in optical and ran some tests to create a gaseous trail which the ghost image trails behind her. The glints along the edge of her body, pulled from water reflections, appear to be smaller faeries that are flying around her all the time. It is a great looking image."

Introduced in the Faerie Forest sequence, are two Brownie characters who befriend Willow and decide to accompany him on his adventures, to the delight of audience and dismay of ILM's effects wizards. Since these two Brownies appear in a total of some 150–200 shots, Muren formed a special "Brownie Unit" headed by effects supervisor Mike McAllister. "I worked out the techniques at the start as to how we were going to do this," Muren recalls, "and then

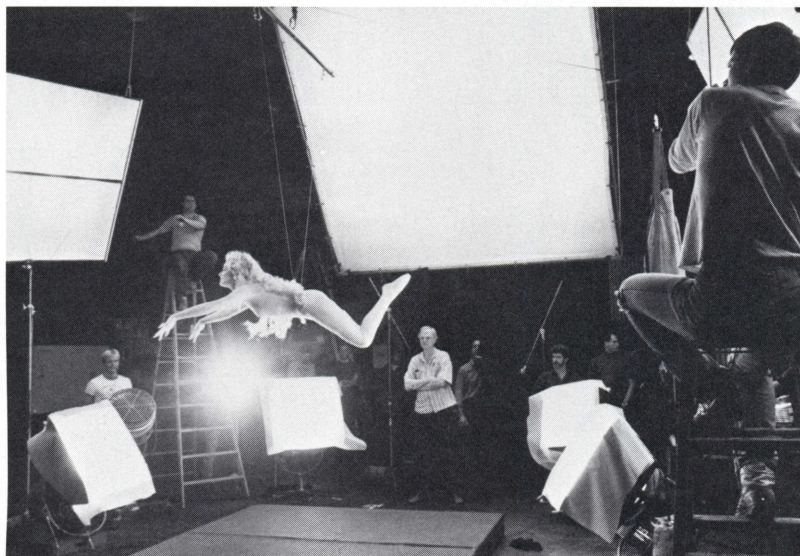
Mike followed the live action crew around the world shooting background plates for the Brownie sequences – he was actually on set through the whole shoot. Most of our shots are based on the idea of the scene in *The Bride of Frankenstein* where Dr. Pretorius displays his miniature human creations. There's that amount of boldness applied to many of the 150 shots. The camera's always panning around and they are always seen standing on people's shoulders and so on, so they look like they're right there – we didn't cheat! The Brownies were either shot live on great big oversized sets we built here, or else they were shot on blue screen and then re-photographed, reduced down and plotted in so that their movements match with the action in the background plate."

Whenever possible, McAllister opted to shoot the actors playing the Brownies on oversized sets to avoid compositing as many scenes as possible. "We built about ten different oversized sets, not including our oversized forest set," McAllister says. "We tried to use them as often as we could since it was much less expensive, we could direct our actors easier and we could see what we were getting right on the spot. Also, the Brownies have got the worst light, frizzy hair, which is very difficult to composite, so I wasn't too thrilled about putting 40 close-ups through optical under those conditions. So we shot almost all of our close-ups on the oversized sets. We used 100mm and 300mm lenses with limited depth of field so the focus would appear shallow. As soon as we pulled back and you see the full character or even half of them in frame, we went to blue screen.

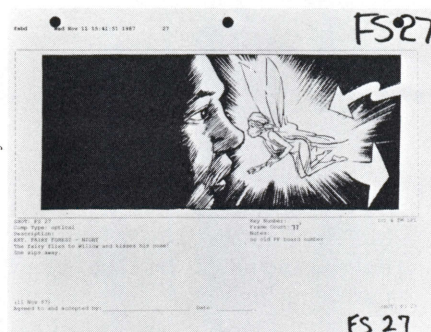
"The Brownies have a major role in the film," McAllister continues. "The difficulty was to make them appear to behave and interact as if they're real people. If we could've cast them with nine-inch-tall actors, we would have. The idea was always to stage the scenes and dialogue as through the Brownies were an integral part of the scene when it was shot on location – only we had to do it all after the fact!"

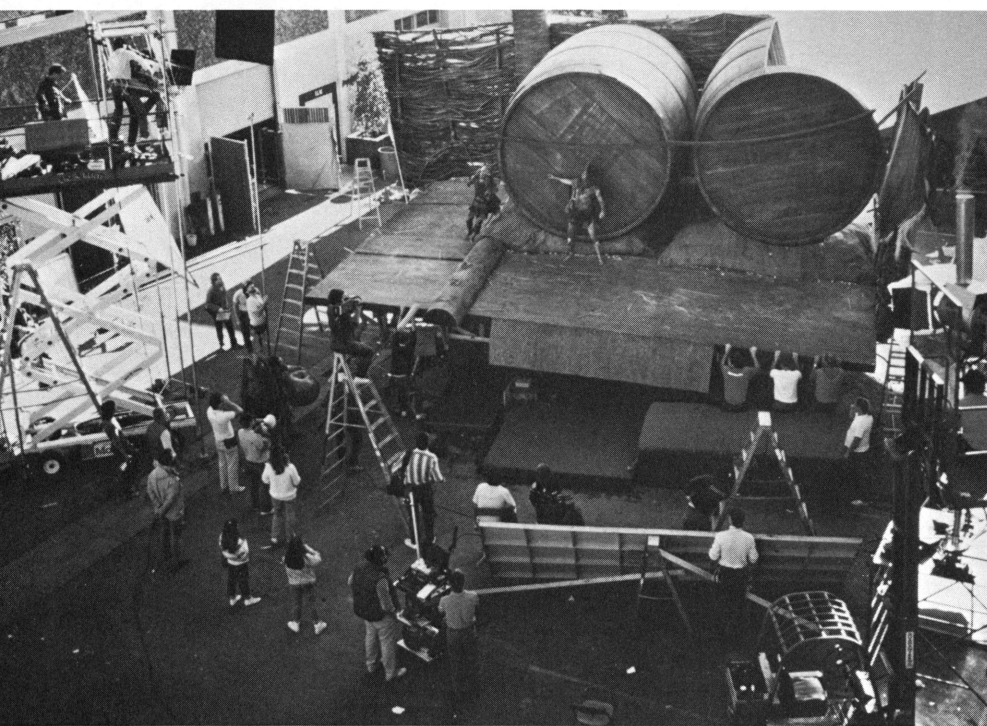


Willow (Warwick Davis) is kissed on the nose by a tiny, glowing faerie. Left: Photographing the faerie element for the scene above. Below, left: Dennis Muren preparing the faerie queen for the camera. Below, right: A storyboard panel.



Photos by Kerry Nordquist and Sean Casey





Above: Some of the Brownie scenes utilized oversize props such as these casks in a gigantic wagon bed outside ILM soundstage. Right: Brownie and cask as they appear in the movie.



Because of the Brownies' scale and the large number of shots they appear in, Muren and McAllister realized early on that there would have to be a significant number of high angle shots looking down on the little people, which meant the blue screen stage had to be equipped with a blue floor. "We decided to rethink the entire blue screen system," Muren relates. "We threw out our own specifications and decided to start all over again to see what we could get

away with. We started doing tests in May or June, 1987, against different kinds of blue fabric and a painted blue floor. I was hoping to be able to retain the real actors' shadows, and we managed to do it in our test on a 40 foot square stage, but when we upped our scale on the real stage, which was 70 feet square with a 30 foot cyc on either side, there was so much glint and sheen that the shadows were contaminated, so now the shadows have to be added. We ended up

using a painted blue on the stage floor that worked just like Chroma-Key – we painted the area blue, lit it and then let our actors walk along it. Ken Smith, who handled our Brownie opticals, said that if we could control the color of the Brownies' costumes, we could do some tremendous blue screen work. We insisted that we needed to control that aspect and jumped at the opportunity."

In spite of maintaining this kind of control over the Brownie elements, Smith found that the Brownies presented unique challenges in terms of optical compositing. "About half of the Brownie shots involved a further complexity," Smith reveals. "They had to run over terrain. We couldn't just matte them into a spot and have them stand there, they actually had to run across logs and jump off wagons. To make things worse, quite often the camera was panning in the shot as well, which meant that John Knoll in animation had to handle plotting them into the shot and match their movements to the pan on the background plate.

"It became a much more complicated procedure for us because the Brownies were shot against a painted blue floor – in fact, it became like doing two composites. We had to pull our mattes from the blue screen characters off the painted blue, then once we created those mattes and did a composite of the Brownies for color, that then had to be sent to animation. They would do the pinblock move on first the color pass and then the matte pass, at which point we'd get that negative back and start all over again. We made the printing elements from their negative and generated new mattes because now the shot had a match move on it," Smith said.

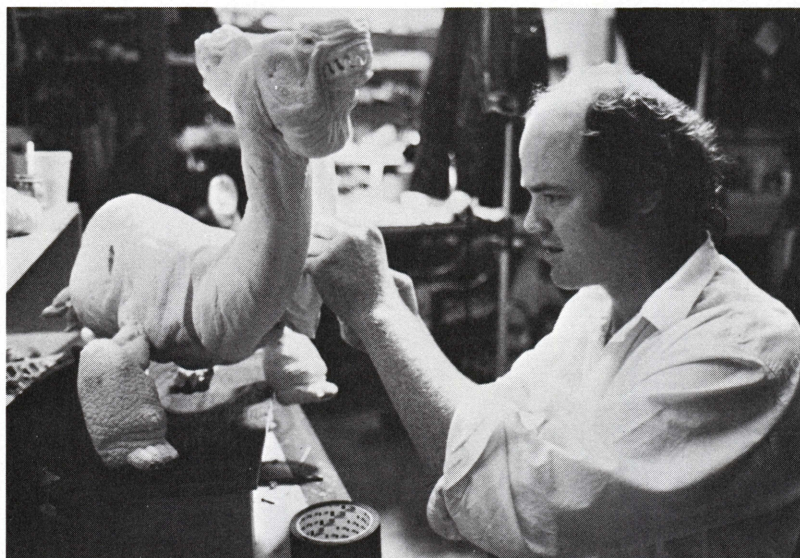
"Also, because the Brownies were shot on that painted blue surface, it limited the ability of the stage crew to light them properly to match the lighting in the background plate – if the floor wasn't properly illuminated, we couldn't pull our mattes. Consequently, in many instances, we were required

to manipulate the contrast range so the Brownies can appear to walk from darkness into light, otherwise they'd look like they were glowing in the dark! For example, there's one shot where they're hiding under a helmet, and the helmet is lifted away, revealing the Brownies. As that happens, their exposure changes, so we had to do that as we were compositing the scene."

No self-respecting epic fantasy can be without its fire breathing dragon, and *Willow* is no exception, except that the Ebersisk monster which threatens the diminutive heroes is twice the creature St. George fought since it has two heads. Willow and his new-found friend, a warrior called Mad Mardigan, face the Ebersisk on a battlefield as armies clash. Eventually, Mardigan succeeds in defeating the beast, but not before it lets go with several fiery bursts, destroying a bridge, and consuming several infantrymen.

Supervising the sequence was animator Phil Tippett, who most recently created *Robocop's* nemesis, the Edd 209. Because of Tippett's lengthy involvement with that picture, the Ebersisk was designed by Richard Van Der Wende. "He designed the head and the body, and Randy Dutra and I contributed some of the details. The monster is a cross between a shark, a dinosaur and an elephant," Tippett reveals. "We tried to come up with something that was an amalgam of a lot of elements taken from various animals. The feeling we were trying to get across was one where you see something strange and powerful for the first time – there's something disconcerting about it. We wanted to blend the lethal qualities and still retain a comic edge to the creature. It's a very traditional fire breathing dragon, and George insisted early on that it have a reality to it so it would seem like the real creature that gave rise to the mythical idea of dragons.

"We made two puppets for two separate setups," Tippett continued. "One was the complete creature and the other was two-thirds complete. Tom St. Amand



Left: The monstrous ebersisk in action. Below: Phil Tippett and the unfinished ebersisk.

designed the armatures, which were built by Blair Clark. The armatures were pretty conventional stop motion/go motion armatures, except that they were quite large – about three feet long. There were about 40 shots altogether in the sequence, and they were animated by St. Amand and Harry Walton, and Bruce Nicholson was the optical supervisor."

The Ebersisk is essentially the product of Willow's misuse of his magical powers. When he points his wand at a troll, it meta-

morphoses into a giant, fire breathing dinosaur – via various simple optical effects, a bit of stop motion and some cable puppetry. "There were only a few shots to intimate that the transformation was occurring," Tippett remembers. "Part of it was done by double exposing smoke over some existing elements. There was one stop motion shot of the troll's body splitting open to reveal an egg. In the next shot, one of the Ebersisk's heads breaks through the shell – a cable operated effect."



Gordon Tait operating part ostrich-part peacock creature which evolves into good Queen Raziel.

Animating the sequence proved rather difficult for Tippett and his crew, since the Ebersisk was somewhat limited in his ability to move around. "Basically, it's always standing in one place," Tippett explains, "so there wasn't a great deal it could do besides bend down to pick people up or blow fire at them. It was a very hard sequence to do because we had trouble finding motivation for his actions. Also, because it was a two headed monster, we had double the work to do since both heads had to be moving all the time."

In an effort to help the beleaguered optical department, which was swamped with hundreds of Brownie shots as well as many other sequences to composite, Tippett and Muren decided to try an experiment. "We decided to use Ray Harryhausen's rear projection background system to composite some of our shots in camera," Tippett says. "We wanted to see if the two systems – optical compositing and in-camera compositing – would hold up when placed pretty close together within the same sequence. We only used the Harryhausen system for about ten shots. Unfortunately, the two techniques turned out not to be

sympathetic to one another, so we had to be very careful, if we could avoid it, to keep shots done in either process from cutting together."

Other problems arose for the optical compositors when a large mechanical head of the Ebersisk, built for the climax of the sequence, failed to work properly. The full scale head was to have reacted against Mad Mardigan as he killed the creature – instead, the actor had to be composited to match the stop motion puppet. "They ended up shooting the actor who played Mad Mardigan on a dummy head of the Ebersisk against blue screen," Tippett recalls. "The shot was very static, which created problems later on for John Alexander in optical. He had to move the Mad Mardigan element in some sort of configuration that looked as if he was being whipped about by one of the monster's heads. Since the plate of Mardigan was two-dimensional, there was no way to make him seem to turn around, which made it very difficult for John to match move him into the scene – all he could do was move him north, south, east or west and roll. John also created a move of Mardigan flying through the air, and Tom St. Amand and Pete Ko-

sachek programmed their stop motion to match to that clip at that point. Then the animation department had to create mattes – it was a horrible, incredibly involved process and a great deal of it was done as an afterthought to try to figure out a way to make this footage work."

There are any number of magical transformations in *Willow*. In addition to the troll into Ebersisk metamorphosis, we are treated to the *de rigeur* transmutation of an army of soldiers into a horde of squealing pigs via the conventional prosthetics and air bladders method first pioneered by Dick Smith in *The Exorcist* and made popular by Rob Bottin in *The Howling* – these effects were handled live by the English makeup crew. There is one magical transfiguration in the film that defies all previous technology. Throughout the tale, the Good Queen has undergone a series of animal incarnations and at its climax, finally is restored to human form. Muren vowed to handle it all on-camera, using a combination of rod puppets and computer image processing technology to blend one animal into another: "It's all three master shots with no close-ups and very few cutting cheats. It's a very elaborate transformation. She changes from goat to ostrich to peacock to turtle to tiger before she finally returns to her human shape and becomes a woman lying asleep on her side, nude. It's pretty high tech – from the turtle to the tiger to the woman will all be one shot, and we don't want it to look like ordinary lap dissolves, so we used the computer to blend each of the different shapes. Image processing means altering an image mathematically – it's the same technology used on computerized weather maps to show changes in temperature and density and so on. The same idea can be used to twist other images around. We're matching the movements and the shapes of two different characters and computing the blend from one to the other to make a continuous synthetic image. We're not generating images with the computer, we're merging two images that exist on

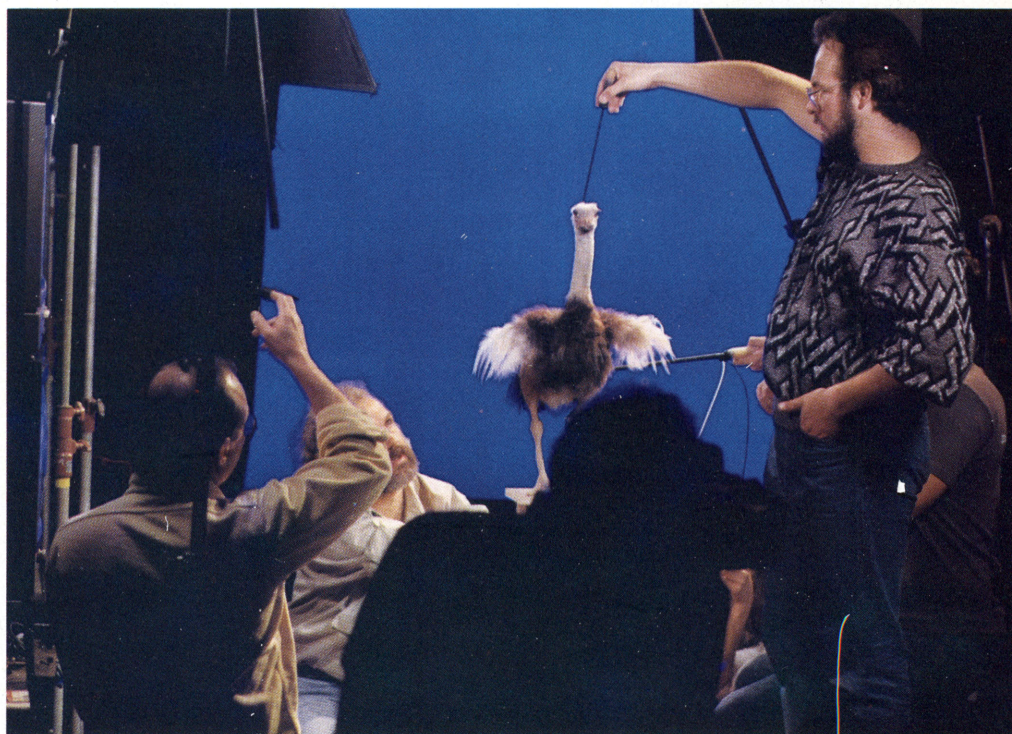
film over a period of time." Available Light, a Burbank company, animated dozens of lip-sync talking animal shots.

Supervising the complex rod puppetry work is animator Dave Allen, who recently handled similar chores on *Batteries Not Included*. Tad Krzanowski, designer of the "hidden wire rig" for *Batteries Not Included*, designed and built the elaborate mechanics inside the various animal puppets, along with Gordon Tait, who also sculpted the animals' outer skins. Jean Bolti supplied the "taxidermy work," adding feathers and fur to create a realistic impression. Animating the sequence was primary puppeteer Tony Hudson and Bob Cooper. Allen describes his contribution this way: "I just hung back and made sure that the moves of the animals that were to be overlapped matched each other by checking them out on the video monitor and working closely with our effects cameraman, Terry Kostner. Really, I just made sure everything stayed on track," he adds with characteristic modesty.

Allen credits storyboard artist Dave Lowery with locking down much of the final look of the transformation sequence. "Dave developed the storyboards from my discussions with Dennis," Allen recalls, "and he made certain choices that were very helpful in focusing on the looks of some of the composite creatures."

Because of the complexities involved in trying to blend two separate images into one, Allen opted to shoot all of the footage to be linked in this manner in sequence. "I tried to do it more or less in order, though it wasn't always necessary," Allen affirms. "Whenever we cut away to Willow watching, I was relieved of the obligation to shoot in sequence. When the models were successively linked, however, I felt we should make every effort to shoot them in the correct order. Otherwise, we might have run into unforeseen problems by shooting the tail end first."

The sequence kicks off with the startling transformation of a goat into an ostrich, most of



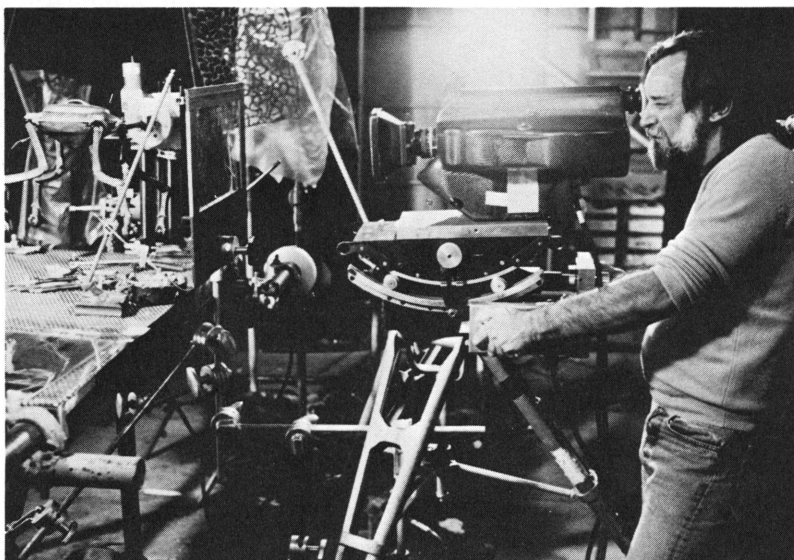
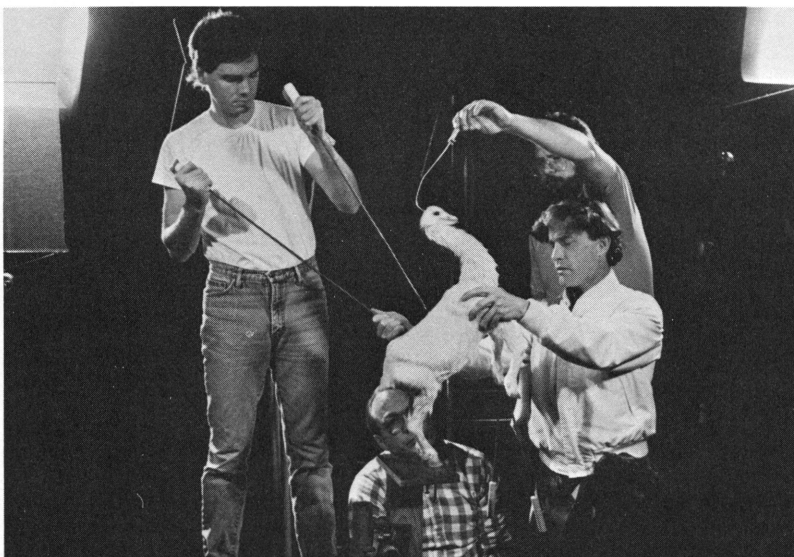
Above: Charlie Bailey, Lorne Peterson and Tony Hudson help in the metamorphosis as Terry Chostner mans the camera. Left: Nick Stern, at computer graphics station, manipulates blue screen mattes electronically during transformation sequence.

which was handled mechanically. The goat's neck begins stretching, its head changes to that of an ostrich, and its forelegs become wings and sprout feathers, all over the course of two shots! Creating a structure for the goat's neck that could subsequently stretch from 1" to 24" was the first hurdle Krzanowski's physical effects crew had to solve. "At first, Tad tried an interlocking lattice of PVC tubing that telescoped out," Allen recalls. "It looked promising but never went too far. Instead he went with

compressed scotch foam, which worked out very well."

The difficulty lay in covering the neck with a material that would look like goat fur when compressed and ostrich feathers when it expanded. Jane Bolti ended up applying short ostrich feathers to the neck, which gave it the correct quality in both positions. "Covering it with fur required a very complicated technique," Krzanowski says, "since we couldn't do anything to restrict the foam's ability to compress. We had to use a special

Top:
Operating complex models are (clockwise from left) Blair Clark, Tony Hudson, David Allen and Charles Bailey.
Center: Cameraman Bob Hill uses a transparent grid to line up shot of demonic brazier which comes to life. Below: Pat Sweeney and Mike Olague set up interactive lights for the glowing faeries in the miniature forest.



glue, and Jane had to apply the feathers in the condensed position. Several cables hidden inside the foam neck keep it compressed, and by releasing them, the neck will not only appear to stretch, we can also make it perform."

Why did Krzanowski, Allen and company go to such lengths to get the goat's neck to stretch, when the action was going to be run through a computer anyway? The answer is that computer image processing is still in a fairly primitive state, as Krzanowski points out: "We decided to handle this sequence physically because the computer can only handle linear blends. If we used the computer, when we stretched the goat's neck into an ostrich's, we could only have moved it up and down, which was too limiting. We wanted the animal to be reacting as if it was in pain."

As the goat's neck grows, its head also had to take on the characteristic look of an ostrich, a problem solved by Krzanowski's associate, Gordon Tait. "Gordon decided to do the goat to ostrich head transformation using a vacuum," Allen recalls. "Under the rubber skin of the goat, he put a fiberglass ostrich skull. By putting a vacuum line in, he could actually suck the rubber goat form down onto the underlying ostrich form, and it worked just like a vacuform machine. At the same time, Gordon rigged it so other things could be happening to effect the transformation: the goat's horns were made of form rubber and could be pulled into holes in the fiberglass ostrich skull underneath by means of cables, and the ears also sucked in and disappeared through two other holes in the skull. All of that was done on cue, and occurred as the neck was stretching.

"In the next shot," Allen continues, "the goat rears up as it finishes transforming into the ostrich. In order to match the movement of the goat's legs to the movements of the ostrich's wings to effect that transformation, we created an unnatural joint in the goat's foreleg that a real goat doesn't have. The joint was about even with its chest, and was designed to bend



Top: *Miniature tent by Paul Huston, lit from inside, has been matted into latent image silhouette.*

Below: *Matte painting by Mike Pangrazio of night camp in snow with silhouetted tents.*

straight up and then back in a winglike configuration. In this shot, the neck was already stretched and we substituted the ostrich head for the mechanical goat/ostrich transformation head. We painted it a goatlike color and added fur to it. The difference in the size of the two heads is quite apparent – it becomes much smaller in this shot. My feeling was that if we panned off the transforming goat's body in the first shot so we lost our frame of reference, when we then cut back to the next shot, the fact that the head was smaller as the goat's body turned into the ostrich's wouldn't be a problem. I think we got away with it, even though the head in the second shot is half the size it was in the first."

As if this first transformation wasn't complex enough, Lucas decided that when they returned from Willow's reaction shot after the goat's body had become an ostrich, the ostrich should be partly through another metamorphosis! "After all the boards were done," Allen recounts, "George asked us to add a peacock stage to the ostrich transformation. Gordon Tait came up with the idea to mechanize it using a reworked umbrella mechanism – it was stepper motor driven and worked the way an umbrella unfolds. Though it was made so it could be shot as a separate element and then composited into the scene, I was against shooting it as a separate element. We shot it as



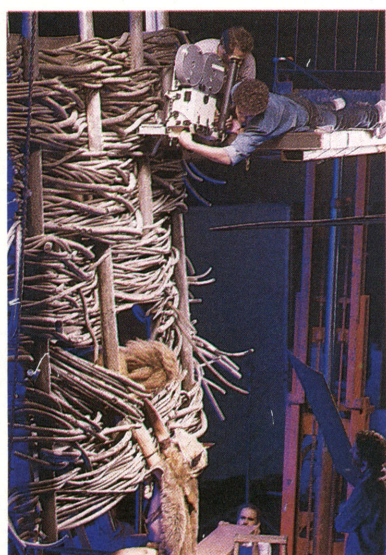
a hybrid ostrich/peacock puppet because I thought that otherwise our ability to synchronize the different elements would be limited. It worked out really well."

Next, the composite ostrich/peacock had to be transformed into a turtle. "The peacock feathers begin to fold up as the ostrich sits down," Allen says. "This action covers her legs, which was necessary in order for her body in profile to resemble a turtle's shell. We didn't have the mechanical facility to retract the head of the ostrich, so instead, we used the same technology we used to extend the goat's neck in the first shot to stretch that of our turtle so it would match the shape of the ostrich's. We then matched the turtle's neck to the ostrich's as it was sitting down,

using the computer to select the best point where we could marry the two images into one. That saved us some work."

The turtle to tiger transformation utilizes once again the scotch foam technology established in the first shot to grow something large from something rather small. "Originally, we were going to have the tiger's huge forelegs and paws shoot out from inside the turtle's shell using scotch foam tiger limbs," Allen says, "but Dennis felt that since we cut to Willow's reaction after the ostrich turned into the turtle, when we cut back part of the turtle to tiger transformation should already have taken place. That made our job easier, since we didn't have to show those monstrous legs forming. Instead,

Top: Willow holds a Brownie. Below: Cinematographer Mike McAllister and assistant cameraman Pat McCardle make a blue screen shot of a Brownie, Kevin Pollock, hanging on oversized wagon.



we cut to the turtle with the tiger legs already in place and its shell flips forward and begins transforming into the tiger's face as the tiger's body appears to grow behind it using scotch foam covered in tiger fur. We went to a turtle/tiger composite hand puppet before cutting to the tiger itself. We then brought in and shot a real tiger as the key animal in between the transformational forms on either side of it.

Once all the rod puppetry was accomplished, the various images to be blended were fed into ILM's computers to be image processed. "It's not going to look like traditional bladder and rubber effects where things have to pull away so something else can push

out mechanically," Muren promises. "It's more like a lap dissolve, but not really – the computer decides at each step of the transformation how one character is going to expand or contract to match to the shape of the other. Doug Smithe wrote the software to keep certain reference points – the eyes, the legs, the mouth – in register as it merges one character into another. It's really like watching a plastic object transform from one shape to a completely different shape. The behavior of each of the animal stages as they undergo this painful metamorphosis makes the whole thing seem very real. I don't think you've seen anything like it before."

When the Good Queen has recovered from her transformation, she sets out to battle the Evil Queen in a duel of hand magic the like of which hasn't been seen since magicians Boris Karloff, Vincent Price and Peter Lorre fought it out in 1963's *The Raven*. "It's pretty elaborate: one throws a fireball at the other, who counters with a blast of snow from her wand, turning the first one to ice. I was in England while they shot that to handle the on-stage aspects of it. For example, when the other Queen is hit by the fireball, we did a lighting effect on set that will tie into the optical effects we do here. Similarly, when the other Queen is hit by the snow ray, we shot nitrogen gas on stage. There were also physical rain and lightning effects. We shot our plates

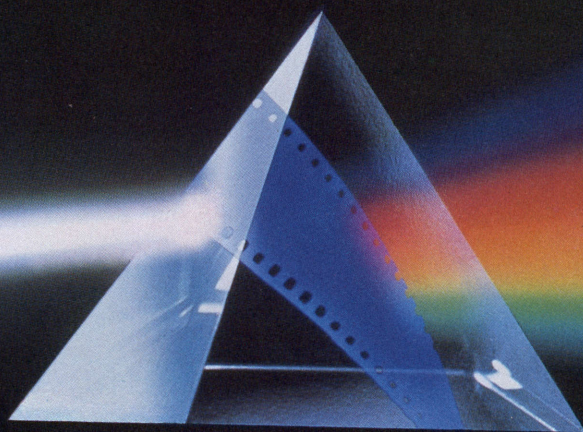
with the rain starting about eight feet from camera, so everything in the background is rainsoaked and then we added rain in the foreground optically. The optical rain and lightning all has to be synchronized to the on-set rain and lightning so it all looks like it's happening at the same time. And if there happens to be a pan shot – which naturally there is – we have to shoot rain elements that will match to the pan. It's very complicated."

In optical, John Ellis is responsible for the Queen's Battle sequence. "We had to add a fire effect in front of the Queen who gets hit by the fireball, then with roto-work we can see her through it," Ellis says.

Ellis' job was made considerably easier thanks to a development in the optical department: ILM's new motion control optical printer. "For the first time, we're able to do moves on elements!" Ellis enthuses. "It has total repeatability to the point where we can repeat moves on our separations. Normally, we'd have to double dupe something like that – we'd have to put the separations together, then take that element and do our move on it. Now we can make our separations with the move.

Naturally, at the end of the battle, the Evil Queen is defeated, which required some elaborate photography and optical work utilizing the new motion control opti-

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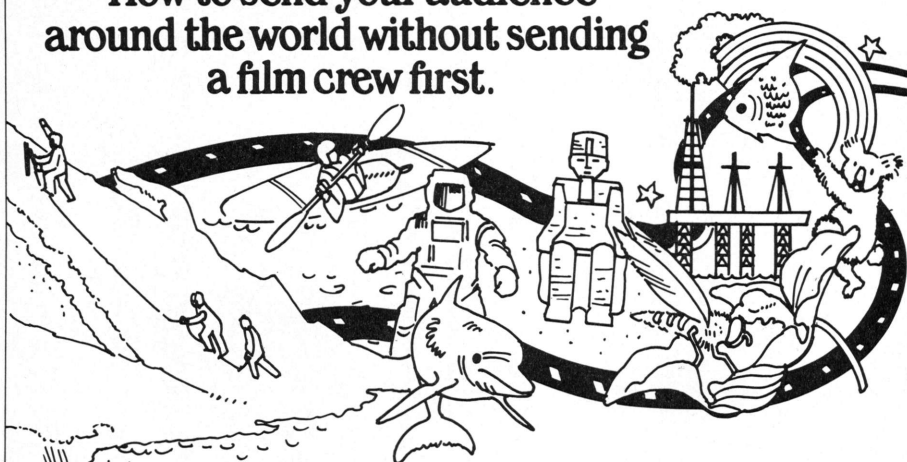
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cal printer. "When the Evil Queen loses," Muren explains, "she turns into a bizarre blood-red smoky mist. We used streak animation to create the effect. We did streak photography, incorporating a lot of programmable little patterns into our camera moves so the smoke looks like it has a life of its own. The effect is made up of many separate passes, and we were able to change the width and the shape of the streaks in each one. At the end, the Evil Queen turns to smoke and flies up into the grating in the ceiling and disappears."

It's hard to tell which of the pioneering effects in *Willow* will be best remembered or most talked about. If the storytelling and performances come together as well as Industrial Light and Magic's truly special effects, then the combined talents of George Lucas, Ron Howard and the ILM team will have succeeded in producing the best effect of all – a cumulative one. △

Things to Come...

In an upcoming issue we tell the tale of an unusual shoot. One cinematographer, Claude Petrone, was given the 'impossible mission' of photographing the interior of an Egyptian tomb without admitting any 'modern' air which might deteriorate the contents.

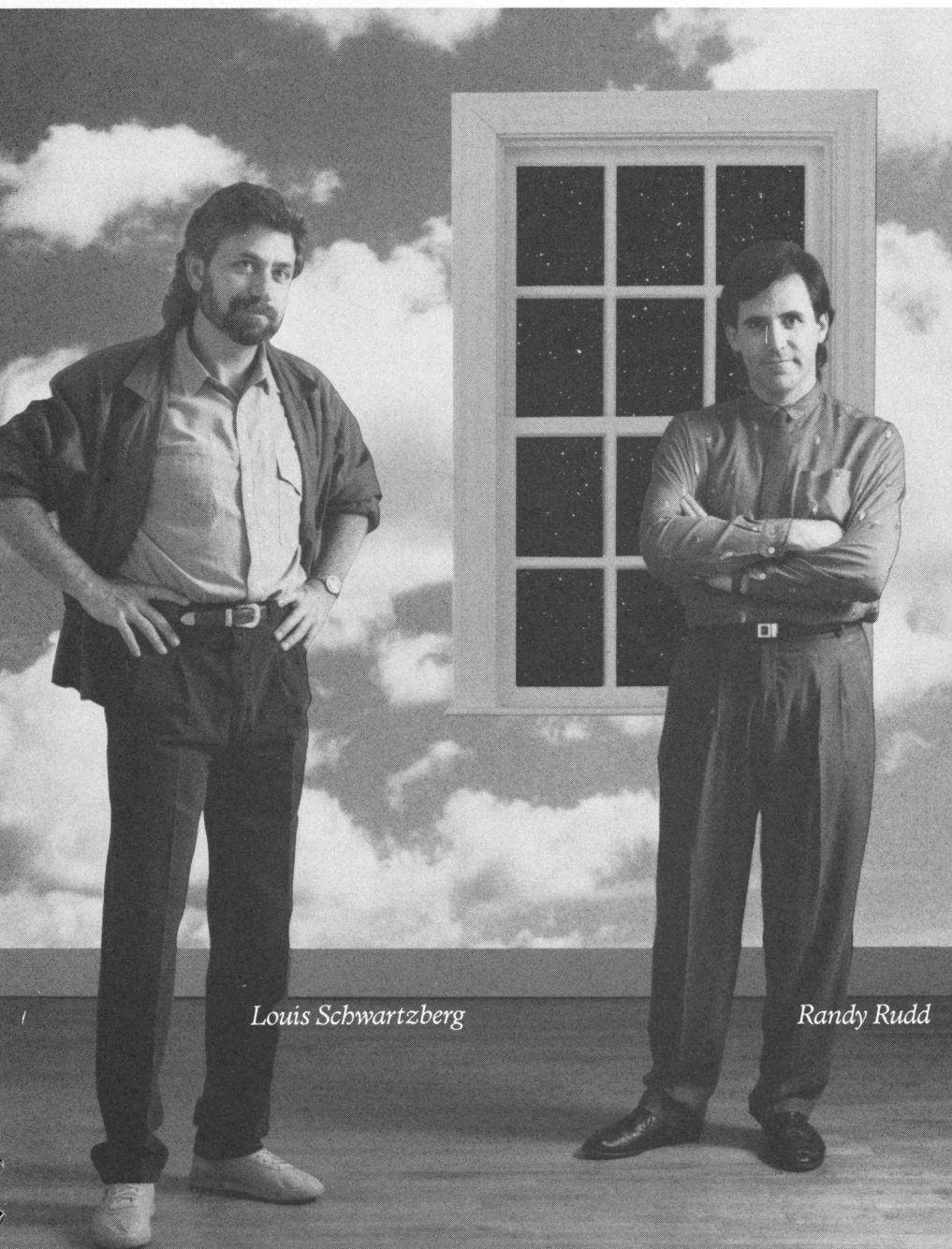


Our October issue will be distributed at the SMPTE conference in New York. The dates are October 14-18, an earlier schedule this year.



Jordan Cronenweth, ASC, talks about a recent experience of photographing a U2 concert. The challenges of this adventure were many.

WHAT HAPPENS WHEN LIVE ACTION AND SPECIAL EFFECTS COME TOGETHER?



Louis Schwartzberg

Randy Rudd

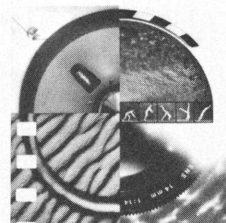
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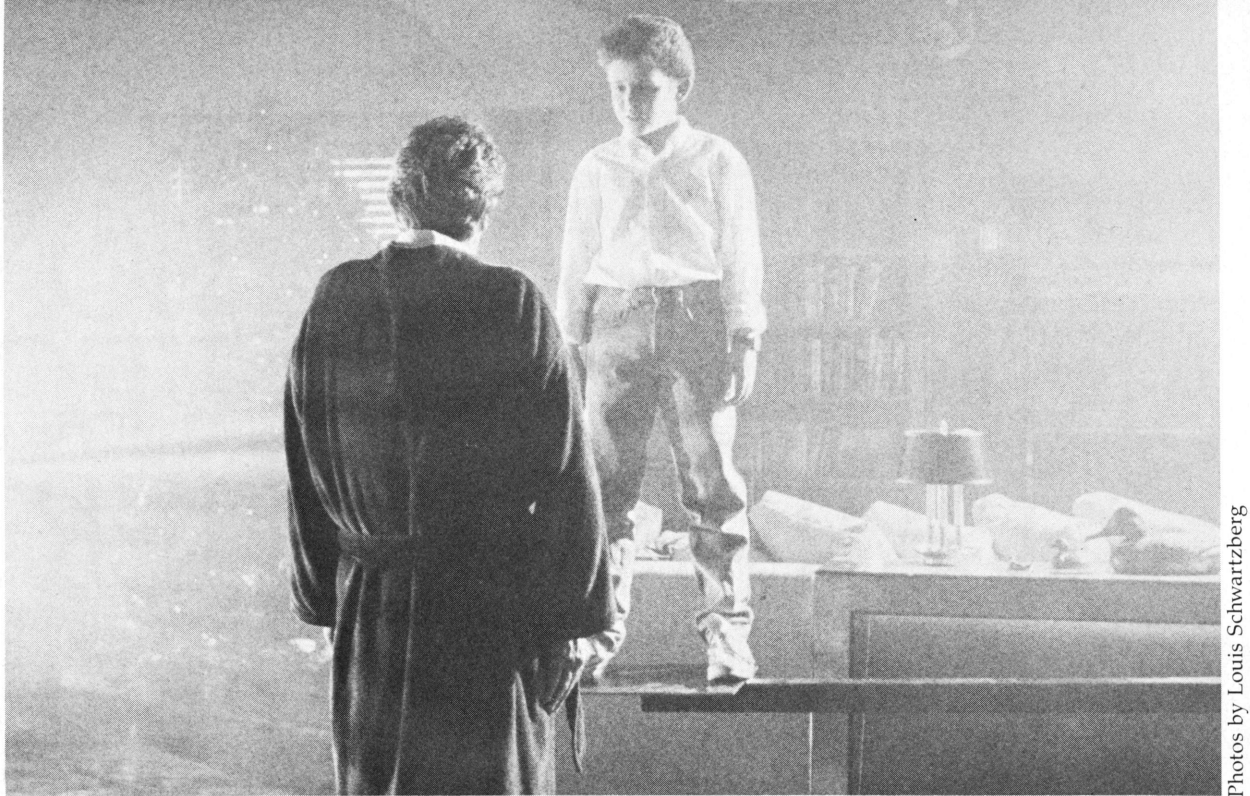
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Photos by Louis Schwartzberg

Role Reversal Effect for *Vice Versa*

by Keith Gayhart

The comedy in the Columbia feature *Vice Versa* revolves around a jewel-encrusted skull that smugglers find in the jungles of Thailand. Like the genie that rose from Aladdin's lamp, the skull has the power to grant wishes. But, as with that Middle Eastern spirit, the old skull has the bad habit of taking people literally.

When 6-year-old Charlie (Fred Savage) says he'd like to trade places with his father, businessman Marshall Seymour (Judge Reinhold), the skull gives him his wish. It emits a burst of light and smoke and casts a spell that causes father and son to exchange bodies.

It takes fewer than 45 seconds on screen for Marshall to shrink to Charlie's size and Charlie to grow to Marshall's, but for Louis Schwartzberg, the film's director of special visual effects, it is the most important scene in the film.

"It was crucial that the audience believe a transformation has occurred," he explained, "because the comedy from that point on is based on the fact that we now have a boy in a man's body and a man in a boy's body."

Schwartzberg has been creating film effects for features, commercials and

episodic television for 15 years. He was the visual effects supervisor for the TV series "Street Hawk" for which he created the illusion of a motorcycle that could turn loops in the air.

For the Orion feature *The Heavenly Kid*, he made an angel walk through walls, caused kids to levitate, sent a woman floating up a staircase, and transformed a car from junk heap to restored beauty in the wink of an eye. He was also responsible for much of the mesmerizing timelapse photography seen in *Koyaanisqatsi*, and for William Hurt's nightmarish hallucinations in *Altered States*.

A dedicated improvisational filmmaker, Schwartzberg has his camera running even when he is not working on a feature, TV show or commercial. He shoots whatever catches his eye. If he sees a beautiful sunset, he dashes outside with a Mitchell camera and records it on film. Schwartzberg has in this way collected 600,000 feet of special effects and live action scenes which he licenses as stock images through his company, Energy Productions, in Los Angeles.

Schwartzberg designed the effects for *Vice Versa* with Brian Gilbert, the

film's director, and Jim Shoppe, the production designer. "Since the skull came from Thailand, we wanted the transformation scene to have an ancient, organic quality," he recalled. "We felt that it was important that it not look high-tech, because this wasn't science fiction. And that it also not look grotesque, because this was a comedy, not a horror show. Yet it had to be believable."

The special effects sequences, and many of the film's interior scenes, were shot in a warehouse, hastily converted to serve as a sound stage, on Chicago's south side. There, Schwartzberg worked with Gilbert's first unit, including cinematographer King Baggott.

Later, Schwartzberg returned to Los Angeles where he and his Energy Productions colleague, director/designer Randy Rudd, created additional optical effects.

Among the sleights-of-hand Schwartzberg pulled off in the transformation scene were some old fashioned theater tricks. Marshall stood on a trap door that was lowered to show him "shrinking" as his robe gathered on the floor, an effect Schwartzberg emphasized by shooting Mar-

shall from above. Charlie, meanwhile, stood on a plank that lifted him as he "grew." This Schwartzberg shot looking up.

Charlie also wore a rubber bladder on his chest that was inflated to show his body expanding. And, the boy's shirt was dipped in acid so it would burst under the stress of his bulging chest.

A much more complicated effect involved the two actors' faces. Schwartzberg wanted to show that Charlie's face was changing into Marshall's by compositing some of Marshall's facial features onto Charlie. Suddenly, the boy would have his father's eyes and nose.

Schwartzberg did this by shooting the two actors against a blue screen with a motion control camera, thereby creating two perfectly matched shots. Later in post-production, Schwartzberg used mattes to cut out portions of one face and then laid them over the other. He ended up with a hybrid face, half boy, half man.

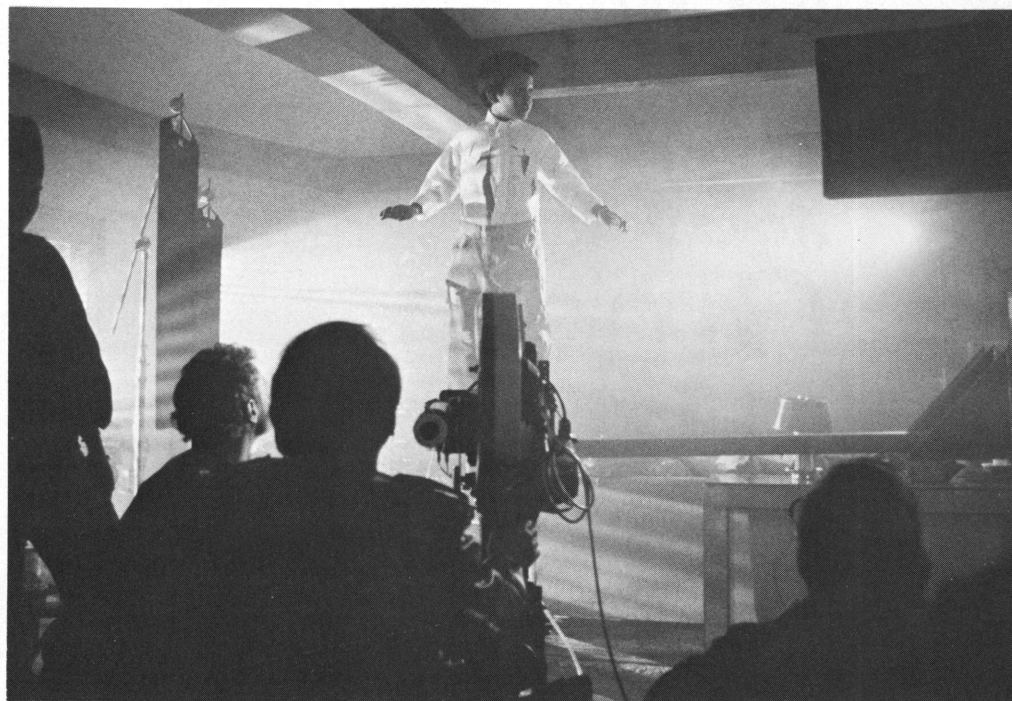
A portable real-time motion control system was used to shoot the scene. Schwartzberg could take it on location and it could shoot at 24fps, so he could use it to photograph actors. In addition, the system works with any standard motion picture camera.

Schwartzberg used it with a Panavision Panaflex Gold camera, the same camera used to shoot the principal photography for *Vice Versa*. The camera was mounted on a remote control head and attached to a dolly, all controlled by the motion control computer. The system could execute pans, zooms, tilts and dollies.

Most important of all, the remote control camera head could "memorize" camera moves in real time. Instead of programming a move on a keyboard, the motion control computer is programmed in real time by memorizing the operator's creative move.

"You program as you rehearse. When you have the move you like, you store it. The system will then play back the move over and over," explained Schwartzberg. "Not only does that save time, it gives you a more natural look, because the move was made by the artistry of the camera operator."

Schwartzberg sees applications for portable motion control systems beyond effects work and says it could become the cinematographer's best friend. "A lot of cameramen shy away from remote control systems because they think such units might take over their jobs," he said. "But it's a terrific tool. It removes the pressure of



having to repeat a shot a dozen times. It also makes the assistant cameraman's life easier because he or she doesn't have to get the focus right time after time."

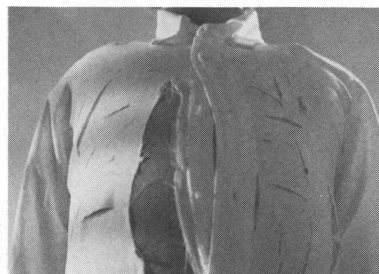
Because the system allows the operator to make revisions, it can be especially useful for complex camera moves. "If you're not happy with the end of a shot, you can fix it. You can save three-quarters of the move and then re-do it from that point," Schwartzberg said.

Schwartzberg used the motion control system to shoot a scene for *Vice Versa* that was not part of his original plans. The transformation scene begins when the skull starts oozing smoke and Marshall throws it to the floor.

"To me, the most interesting shot would be to have the skull coming toward the camera, entering the top corner of the frame, bouncing perfectly at the bottom of the frame and leaving the frame at the opposite corner," Schwartzberg said. "But you'd have to be a great cameraman to get a shot like that."

Still, it might be possible to get that shot, reasoned Schwartzberg, if the motion control camera, and not the skull, "took the fall."

Schwartzberg suspended the skull in front of a blue screen and set it spinning slowly. Then, with his camera turned at a 90 degree angle, he made a jerky camera move past the spinning skull. The skull entered the top of the frame, "bounced" off the bottom, and exited the



Opposite page: Fred Savage is lifted into the air so that Judge Reinhold will appear to be shrinking. Above and left: Savage continues his transformation. Below: A sinking floor and an oversized bathrobe help create the illusion.

other side. When this shot was later composited over a static background, the skull looked like it was tumbling through the air.

"The key to a visual effects shot is to make it look real, to make it look as though the cameraman happened to grab a spontaneous event," Schwartzberg said.

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For the most part, Schwartzberg and cinematographer Baggott used the same lighting, lenses, filters, film stock and f-stops that were employed during the regular production. But there were exceptions.

While the principal photography was shot with Eastman 5294 stock, rated at ASA 400, Schwartzberg switched to 5247 stock (ASA 100) for his blue screen shots. He changed to the finer grained film because he would lose at least one generation when those shots were composited. To compensate for the difference in the stock, Schwartzberg used four times the light on the blue screen as he did on the set.

Schwartzberg's effects scheme included using a burst of light as a manifestation of the skull's magic powers. But, his execution of this effect was limited by the set. Its canvas ceiling combined with the low ceiling of the warehouse left little room to maneuver lights. The solution was to position huge HMI lights outside the set windows and use them to bask the room in bluish-white light.

"It didn't make logical sense for the light to come from the windows, but it didn't matter because it all happens so fast," he said. "And we didn't have another choice."

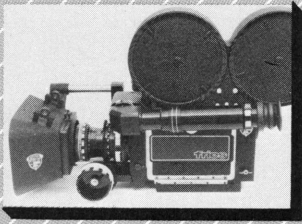
Schwartzberg was assisted with the opticals by director/designer Randy Rudd, a computer graphics specialist, who formerly worked in the studios of Robert Abel & Associates.

They created wisps of fire by drawing pieces of varied fabrics and materials through a water tank on Energy's effects stage and photographing the material in slow motion. They loaded a rotoscope tracing of the transformation scene into their camera and used it to map a path for the wisps around the actors' heads. Rudd also used the tracings to define paths for the flashes of light, which were animated by hand and added to the scene optically.

The secret to special effects, according to Schwartzberg, "is to use a blend of visual techniques and quick cutting, you can't stay on any shot for more than a few seconds, or the audience will begin to pick it apart."

Most important of all, is to know when you've done enough. "You have to leave a little to the imagination," Schwartzberg concluded. "You don't want to show every aspect of the change. Effects are most successful when the audience has to contribute something, because then you're getting them involved in the scene." △

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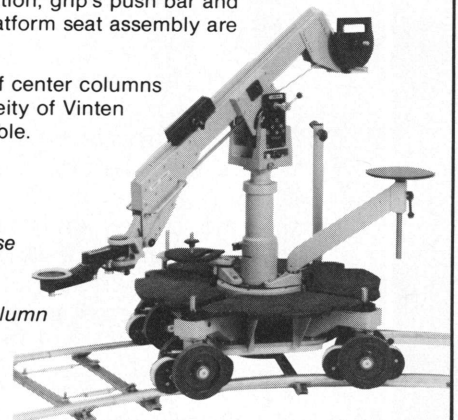
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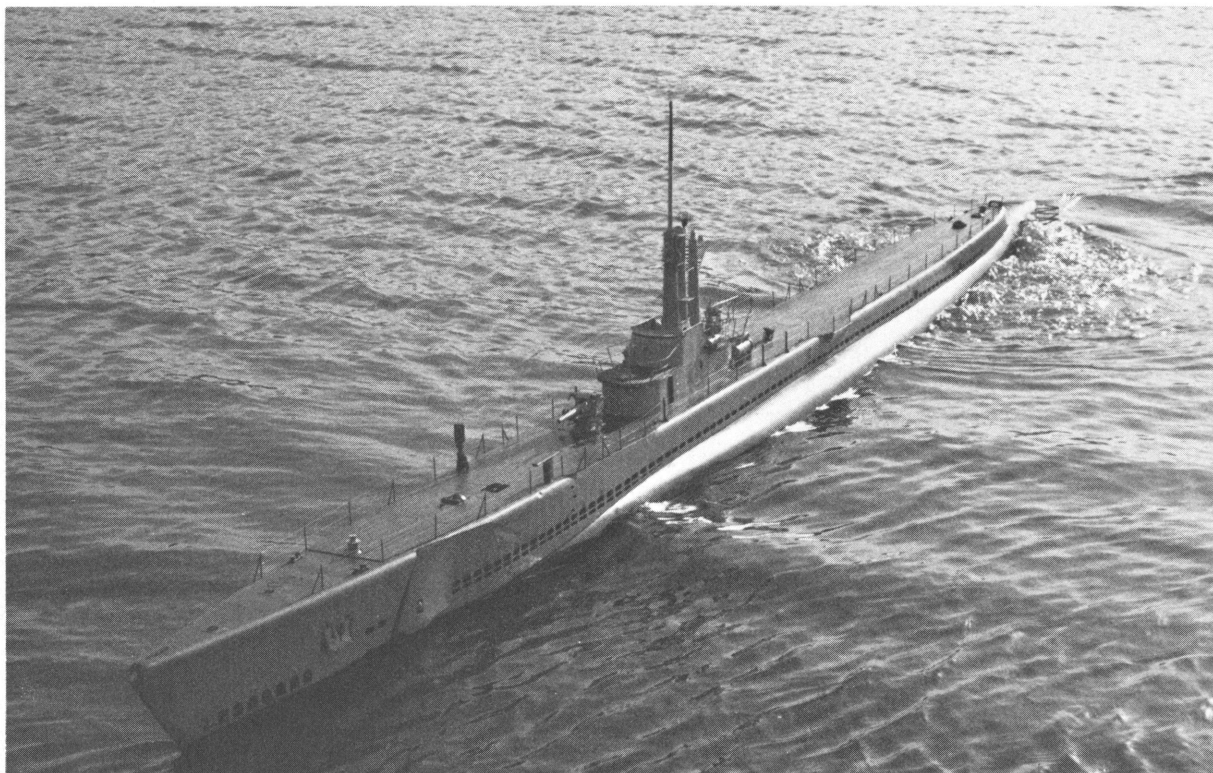
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Photos by Ed Williams

Submarine for *War & Remembrance*

by David Heuring

With principal photography lasting 21 months on locations in ten countries, and a 1,488 page script involving 2,070 scenes, almost everything about ABC's *War and Remembrance* is on a grand scale. The 26 foot, 1/12 scale working model of the USS *Bowfin*, built for the show by Scale Effects, Inc., is a miniature, but in terms of ambition, detail and sophistication, it is consistent with the project's grandiose proportions.

ABC has assembled a veritable armada of miniatures for the dramatization of World War II naval battles in the 30 hour miniseries, which is scheduled to air in early 1989. Twelve miniatures from Paramount, originally built for *The Winds of War*, are being revamped, and several others date from *Tora! Tora! Tora!* The scenes involving submarines, however, posed more complex problems.

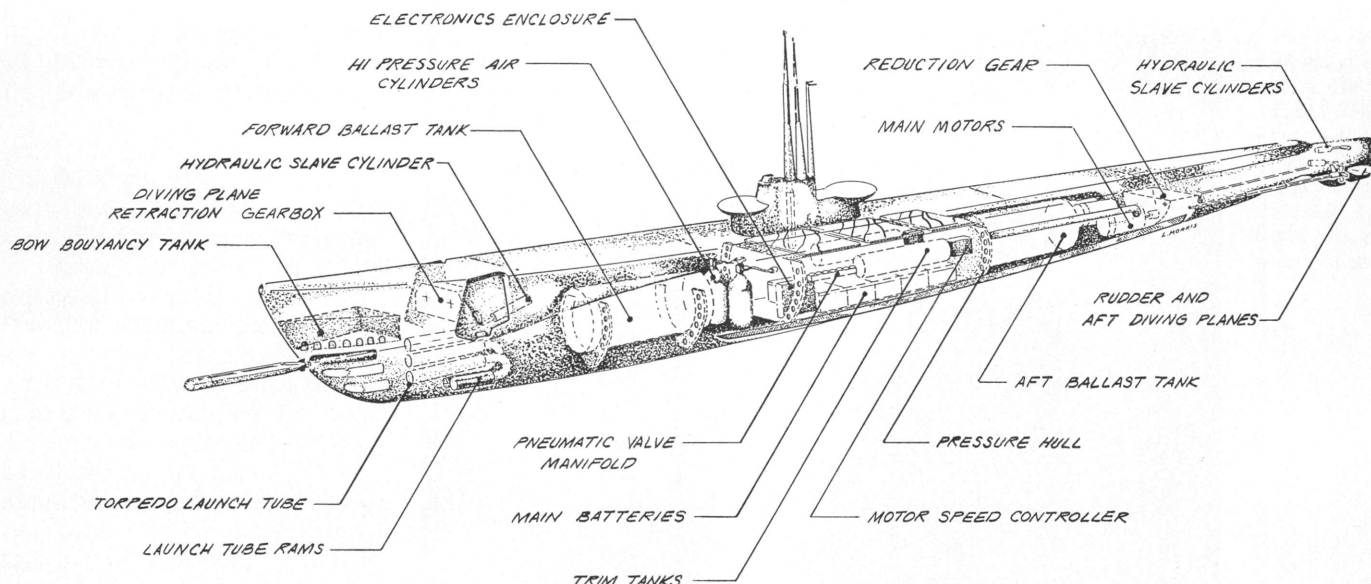
ABC was able to shoot most of the submarine scenes with a full scale ship, the USS *Bowfin*. The *Bowfin*, a Pearl Harbor memorial, hadn't been to sea in 18 years. After being restored to seaworthiness, the sub was fitted with an underwater tow bridle, and towed by a tugboat for scenes on the surface. Activating the ballast system was deemed too expensive, hence the need for a miniature replica submarine, capable of diving, surfacing, maneuvering under water, and firing torpedos.

The miniature submarine was constructed for ABC by Scale Effects. Michael Gallant, international production manager for *War and Remembrance*, recalls the reasons for choosing the fledgling company: "The three bids which we received for the boat were very similar in terms of approach, plans and price. What set Scale Effects

apart was their experience in building model subs. They were able to demonstrate a working nine foot boat, and that was impressive."

"Our goal was to produce an 'actor' for the show, flexible and capable of taking direction," says Ed Williams of Scale Effects. "The tough part was doing it in the extremely limited time period. They needed to run a test launch by April 10, giving us about three and a half months. They provided us with storyboards and videotape of the sequences involving the sub, and told us what it was to be capable of. We expanded the same basic format and procedure that is used in constructing model kits, and made extensive modifications, in some cases developing completely new systems."

The kit plans and Navy diagrams were used in calculating the extensive engi-



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Specifications

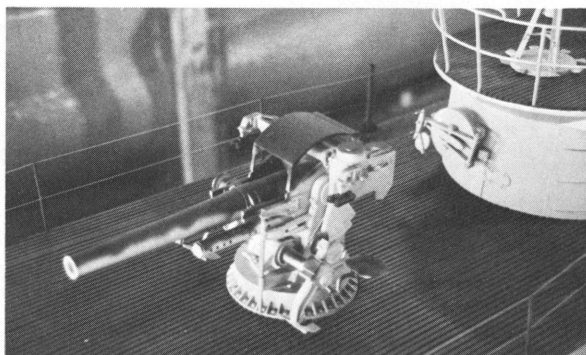
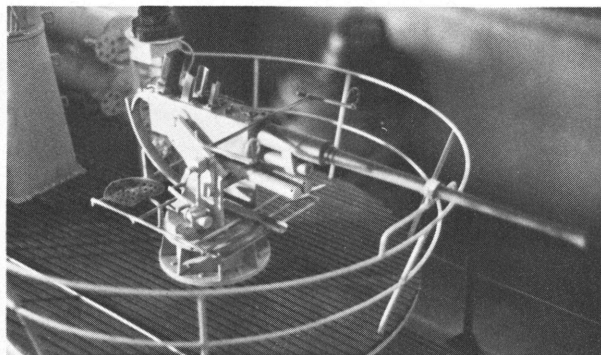
Scale: 1/12 (1"=1')
 Length: 25' 9.0"
 Maximum Beam: 27.0"
 Surfaced Displacement: 970 lbs.
 Submerged Displacement: 3,700 lbs.
 Hull Construction: Polyester- Fiberglass
 Main Propulsion: 2-4HP Minn-Kota Electric Motors
 Maximum Diving Depth: 25'

List of Operational Requirements

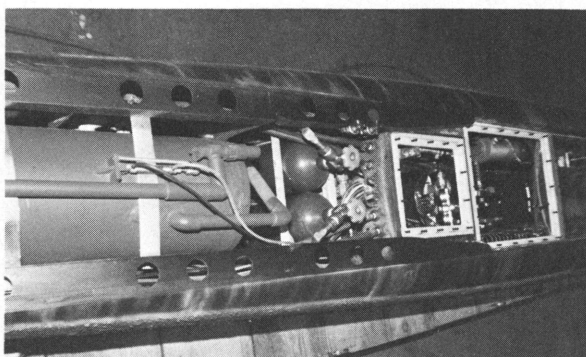
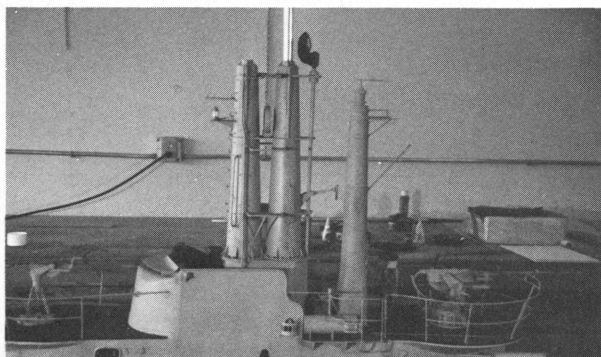
Operating Periscope
 4 Working Bow Torpedo Tubes
 Prototypical Tube Door Operation
 Electric Torpedos
 Rotating Hydrophone
 Pumps for stirring up bottom silt

Control Functions

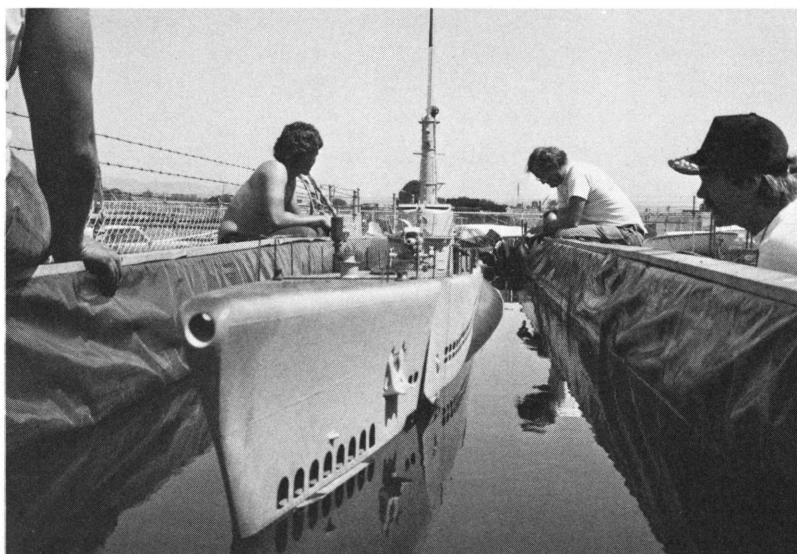
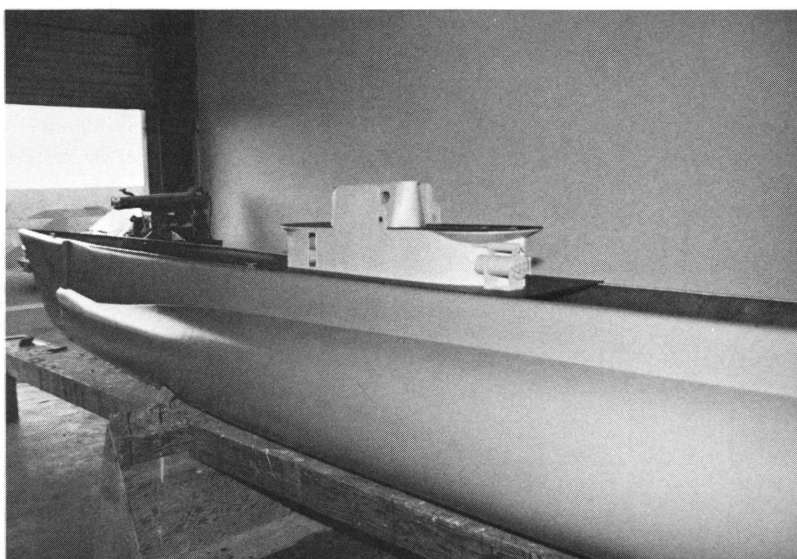
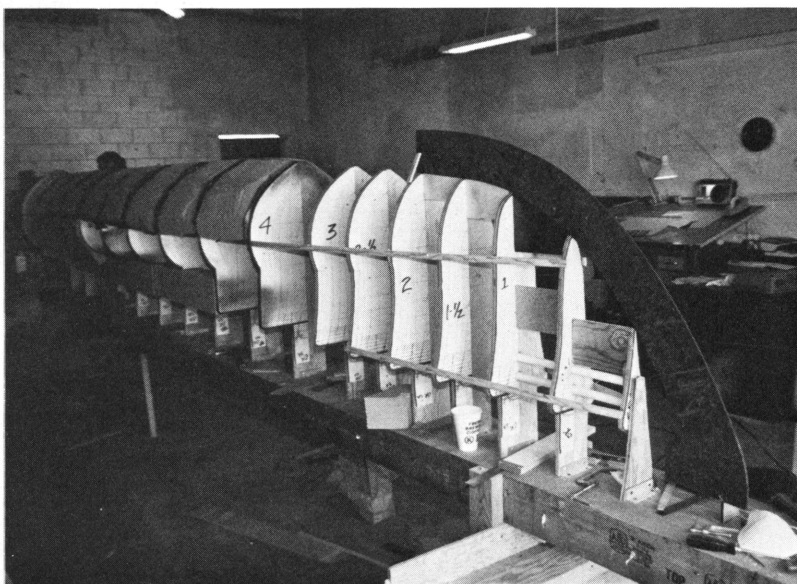
Multi- Channel Radio Control (1 Transmitter w/effects panel)
 Rudder
 Forward Diving Planes
 Aft Diving Planes
 Gyroscope Coupled to Aft planes for level submerged running
 Hydraulic Interface between Servos and Control Surfaces
 Individual operation of Torpedos and Tube outer Doors
 Pumped Main Ballast System
 Negative Auxiliary Ballast (allows boat to settle to bottom)



Opposite page:
 Scale Effects' 27'
 miniature in action.
 Left and far left:
 Details of deck
 guns. Far left be-
 low: Cigarette
 deck and top of
 conning tower. Be-
 low left: Part of
 the maze of interior
 systems.



Right: An early step in the formation of the plug.
Center: The finished hull, before detailing and installation of systems.
Below: A "dry run" in the static test tank.



neering specifications for the boat. A 3'x35'x5' water tank was constructed for static diving, and for testing the sub's many systems.

The exterior of the ship is finely detailed to perfectly match the USS *Bowfin*. Williams spent two weeks in Hawaii, taking hundreds of pictures and measuring "every inch" of the *Bowfin*'s deck. Extensive research was done at the Navy Department on the guns and equipment of the period. Steve Anderson applied his years of modelmaking experience to the replica, reproducing each detail down to the rust spots around the rivets and the dents in the hull.

The first step in building the hull was the formation of a plug, around which the mold was to be formed. Actual Navy drawings were blown up to size and glued onto plywood frame sections for a pattern. These sections were painted black on the outside edges and screwed onto a laminated beam with flanges. The space between the frames was then filled with urethane foam, and the foam was filed down to the black edges to give the plug its shape. At this point the plug is laminated with fiberglass and an epoxy resin to prevent shrinkage. A featherfill primer smooths the final form, which is then sprayed with polyvinyl alcohol, a water soluble barrier coat. Two coats of mold release wax ensure a clean separation. The mold itself is then formed by a thick layer of epoxy tooling foam sandwiched by opposing layers of fiberglass cloth and fiberglass matte. After the mold is separated from the plug, a similar reverse process forms the actual hull. The result is practically bulletproof – a $\frac{5}{32}$ " shell that is strong enough to safely house the boat's systems and withstand the pyrotechnical concussions to be generated during shooting.

"So then we had a big kit with nothing in it," remembers Williams. "That was one of our major milestones. It took us 21 days to get to that point, working some pretty long hours. The next step was putting it in the tank and hoping it would float."

The interior systems of the boat are interrelated, but fall into four main categories: the propulsion system, the ballast system, the special effects systems, and the communications system, by which the operator controls the others.

The propulsion system consists of the motors, propellers, dive planes and the rudder. The drive motors draw their power from a 24 volt battery system and push the boat with two propellers. The

speed control unit is capable of proportional control, which, depending on the angle of the rudder, causes one of the propellers to slow down or even reverse its spin, resulting in a tight turning radius. The motors draw up to 60 amps of current, so a pump was adapted and added to water cool the speed control system. Because the boat will be working in confined areas, and may need to make quick starts and stops, the motors are heavier than normal. For the same reason, four different propeller sets were designed and built. Navy Department specifics were dug up, and the actual degrees of pitch on the real props were used as a reference point, and adapted to the model's horsepower. The propellers are made of solid brass, and the dive planes and rudder are brass surrounding a hollow honeycomb, similar to a wing's construction. Brass was used for durability, and the hollow center makes the dive planes and rudder lighter and easier to operate.

There are two sets of dive planes, which act as horizontal rudders, using the ship's forward motion to control the descending or ascending movement of the ship. The angle of the dive planes, and with it the angle of the dive, is controlled by a simple hydraulic system. The hydraulic cylinders, which also control the steering rudder, are operated by a large robot servo, capable of producing ten foot-pounds. A separate motor "rigs" the forward dive planes in for running on the surface and out for running underwater. An electronic gyro of the type found in model helicopter kits is employed in conjunction with the aft dive plane. When the boat is running at periscope depth, its natural tendency is to "porpoise". Also, any current or water temperature difference can throw off the boat equilibrium. The gyro automatically directs the aft dive plane to correct for these imbalances, keeping the boat steady and level.

The ballast system allows the operator to adjust how the boat rides in the water, and to control the buoyancy, waterline and trim. This system is also integral to the diving and surfacing processes, helping the diving planes control the angle of descent or ascent. The ballast system has three main components: the main ballast tanks, the trim tanks, and the bow buoyancy tank.

The Scale Effects crew sized the main ballast tanks so that when full, the ship's waterline is level with the "cigarette" deck, one deck up the conning tower from

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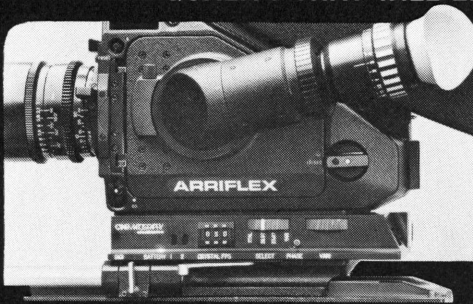
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the main deck. This condition is known as "cigarette decks awash". To achieve the trim, in other words, to have the boat float in this position with ballast tanks flooded, 140 pounds of lead bird shot was added. This permanent ballast also helps the ship ride steady in the water. The main tanks and the bird shot (and, of course everything else in the boat) were positioned so the ship would ride level in the water. Each of the two main ballast tanks have an input pump and an output pump, for filling or emptying the tanks at the beginning or end of a dive. The amount of water in the main ballast tanks can also be varied to control buoyancy, however, for the most part this is the function of the trim tanks.

The trim tanks were fashioned from two large air cylinders, approximately four inches in diameter and two feet long. A mount for a motor and gear train was developed to allow the piston to be moved in and out by the motor rather than by air. The cylinder's air intake was used for a water intake. The motor moves the cylinder and piston rod back and forth to draw in or push out water, giving the operator a fine tuned control over the trim of the craft. The trim tanks hold about 15 pounds of water and are mounted right at midships. The ship is adjusted and balanced so that less than a pound of water drawn into the trim tanks with cigarette decks awash will result in negative buoyancy, causing the boat to sink, remaining level, to the bottom. This varies with water temperature and depth. When water is forced back out of the trim tanks, the ship regains positive buoyancy and will rise.

The third component of the ballast system is the bow buoyancy tank, which helps the dive planes control the angle of the boat underwater, and makes it more responsive to dive commands. The tank is mounted forward in the bow, and can be filled with water by opening vents in the deck. This helps the boat take on a steeper angle and dive more quickly. Once the sub reaches the desired depth, the bow buoyancy tank can be cleared by blowing air into the tank, which forces water out and levels the boat much more quickly than dive planes could alone.

The special effects systems on the submarine were developed for specific scenes in the script. They perform a variety of functions, from firing torpedos to raising or lowering the periscope. The bow section, which houses the torpedo firing system, was assembled separately and added later,

due to the complexity of its construction. The torpedo firing tube is a seamless aluminum tube. Measurements taken from the USS Pampanito were used in the design and construction of the complicated torpedo tube outer door mechanisms. These doors are operated by pneumatic cylinders powered by a 60 pound air system.

Rather than using a piston ram or the CO2 systems found in most model kits, the torpedos are fired with a water plug, in a process patterned after the real submarine firing mechanisms. The torpedo, when resting snugly in its firing tube, is surrounded by water. A piston, set in motion by a 100 pound blast of air, forces the water forward, firing the torpedo approximately six feet out into its course. The air pressure is supplied by a 2,000 pound nitrogen system, regulated to 100 pounds. The passage of the projectile out of its chamber throws a magnetic switch, starting the torpedo's own miniature propulsion system. The battery, motor and counter-rotating propellers then take the torpedo on its way. The system was constructed to allow the operators to vary the speed of the torpedo motor, the speed at which the torpedo is fired, and the amount or intensity of the air bubbles accompanying the torpedo launch, all subject to the wishes of the director.

Another special effects system allows the boat to stir up silt and dust from the bottom, as called for in the storyboards. Molded into the base of the hull is a tunnel which runs the length of the boat. A pump forces water, air, or a combination of the two, through a tube in this tunnel, to a series of holes along the keel. Stirring the silt helps to give the illusion of heaviness and mass when the boat comes to rest on the bottom. Again, the quality and quantity of these effects are variable, and at the director's discretion.

The controlling element which ties this maze of systems together is the communications system, powered by a separate 12 volt battery source. A standard seven channel Futaba radio was modified and expanded to 29 channels, each governing one of the ship's functions. Operation of the submarine functions is divided between two control panels, one for the actual driver, and one for the special effects. The driver controls the speed, the rudder, the dive planes, and the gyro; the other functions are the responsibility of the special effects operator. The Futaba radio transmitter was beefed up to produce 20 watts of output power, and a special underwater antenna

was rigged. A data pulse train is transmitted to a receiver on the boat. A portion of the signal is transmitted through a surface antenna in order to maintain contact when the ship resurfaces. Nine circuit boards in the decoding device interpret the data train and send commands to the various switches and motor controls throughout the ship. In some cases this system is augmented by timers. For example, when a signal commands the main ballast pump to fill those tanks, a timer is keyed to shut off the pump automatically when the sub reaches cigarette decks awash.

The scenes involving the miniature submarine are being filmed in a 100'x95'x10' indoor tank at Pinewood Studios in London. The driver of the boat, the cameraman and the director will be in a diving bell, and the special effects operator will be out of the water, linked to the bell by headset and monitor.

Perhaps the most amazing aspect of this project is that it was undertaken and completed in less than four months. Given more time, (and, of course, money) the Scale Effects crew could have incorporated an even more dizzying array of systems to further automate the boat and provide the operator with fingertip controlled versatility. Ed Williams elaborates: "What we have in mind for the future is to link the control of the sub to a microprocessor. We are working with Vantech, an electronics company which helped us on this project, to develop a robotic microprocessor base which would allow us to program the boat to perform a series of functions. To alter the set performance now requires opening the sub up and making hardware changes. For example, to change the timing period on the ballast tank, we have to stop, go in with a screwdriver and reset the timer by hand. With the expanded control and memory of a microprocessor, we could cut down on the time it takes to make such changes and greatly expand our adaptability. This would also give us the ability to repeat any performance exactly, over and over, with the touch of a key.

"For breaking into the business," says Williams, "a submarine was probably the most complex thing we could have chosen, but that's where our expertise is." In the future, the company will expand its operations to include aircraft and other working models. In the meantime, Scale Effects, Inc. has made an impressive debut into the field of working miniatures. △

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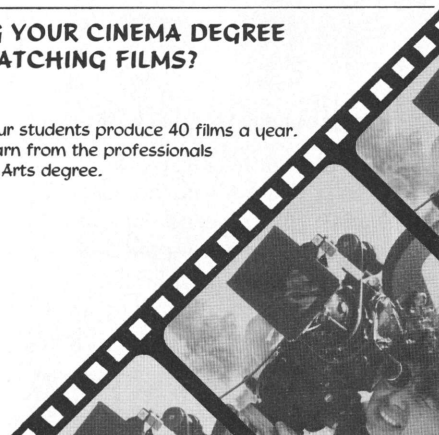


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VideoGram

by Mike Maginot

Barfly

Produced and directed by Barbet Schroeder

Photographed by Robby Muller

Mickey Rourke plays Charles Bukowski's Henry Chinaski, the barfly of the title, as if he were playing Shakespeare. Henry wouldn't be at all likeable if it wasn't for Rourke's flamboyant posturing.

Robby Muller's choice of what colors to correct and which colors not to correct seems natural, as the comic-drama takes place in a world of unnatural light sources.

The bar and bedroom prose and poetry of Bukowski have been lovingly transferred to film by Barbet Schroeder. The intimate atmosphere and straightforward detail make an easy transition to video.

• • •

Brief Encounter

Produced by Noel Coward.

Directed by David Lean.

Photographed by Robert Krasker.

Celia Johnson and Trevor Howard are two happily married people, with respective spouses, who fall in love and feel incredibly guilty about it. Rachmaninoff's Second Piano Concerto underscores their indiscretion and Celia Johnson's narrative.

Robert Krasker's dramatic black and white cinematography, David Lean's incredible technique, and Noel Coward's way with words make it all work with style and grace.

• • •

Nowhere to Hide

Produced by Andas Hamori.

Directed by Mario Azzopardi.

Photographed by Vic Sarin, CSC.

Idyllic autumn in Quebec provides the backdrop for this action/adventure. Amy Madigan plays the wife of a Marine Corps test pilot. Her husband is killed when he discovers the use of an inferior alloy in a helicopter part. Pursued by thugs, the pawns of military and industrial conspirators, Madigan is on the run. Since

her character is a former Marine, the script assumes we will accept her Rambolike abilities.

When scorn turns to vengeance, it is hard to believe that she can get away with murder, but it is only a movie.

Vic Sarin's sharp images cut deeper than the subject matter. The look of the film and Madigan's performance are the film's real firepower.

• • •

CV – Peter Gabriel

CV stands for compilation video. Of the eight music videos represented in this collection, four demand particular attention.

"Big Time," directed by Stephen R. Johnson, is an animation/live-action extravaganza about making it big. Animation and special effects credits go to David Daniels, Wayne White, Peter Wallach, Bill Wright, Spencer Cook, Robert Lyons, Susan Pitt, Michael Sullivan, Tom McLaughlin, Rob Nios, and Joe Castallano.

"Shock the Monkey," directed by Brian Grant, examines man as the descendant of apes and questions the use of simians in laboratory experiments. Images symbolizing the monkey within the man and the man within the monkey illustrate Gabriel's anger with a system that would inflict pain on creatures he considers brothers and the indignities inherent within that system.

A combination of many forms of animation, including some wonderful pixilation, is "Sledgehammer," directed by Stephen R. Johnson. In this Gabriel demonstrates all the things he could be to someone. Animators credited are Brothers Quay, Arddman Animation, Peter Lord, David Sproxtown, Nick Park, and Richard Golezowski.

"Don't Give Up," directed by Godley and Creme, is on two video treatments of the same song. The beauty of this particular version is its suggested simplicity. Actually, it is a series of brilliantly timed elements composited into one continuous shot and performance.

While Kate Bush and Peter Gab-

riel embrace and lip-sync their love-duet, the camera dollies around them catching each of them as they sing a chorus or verse. They are constantly framed, despite the illusion of a stationary position on a matted hill, by a circle of sunlight. As they sing their song a total eclipse turns the blue sky into a starlit night and back again.

• • •

Anne of Green Gables
Produced and directed by Kevin Sullivan.
Photographed by Rene Ohashi, CSC.

Megan Follows stars as Anne in this entertaining production of Lucy Maud Montgomery's classic novel. Anne is adopted by Marilla and Matthew Cuthbert, a brother and sister who run a farm called Green Gables. The strict Marilla is played by Colleen Dewhurst. Richard Farnsworth is the easygoing Matthew. Both are marvelous.

The natural settings and period interiors are beautifully composed and lit, reflecting Anne's sense of wonder at the world around her. This and the equally entertaining *Miracle Down Under* are the first video releases from Disney Home Video's Wonderworks Collection.

• • •

Angel Heart
Produced by Alan Marshall.
Directed by Alan Parker.
Photographed by Michael Seresin.

The causes of the unsettling aftereffects of the film *Angel Heart* are not to be found in the story, but in the Escher-inspired images that lead to the denouement, one that could be easily spoiled by too much foreknowledge on the part of the viewer.

The nightmare world of *The Cabinet of Dr. Caligari* has found its way into other Alan Parker films. *Midnight Express* and *The Wall* are full of dark mad moments. *Angel Heart* is even darker.

The voodoo rituals and grisly murders are never as terrifying as the stairways and elevators that lead to them. Who knows what evil lurks in the shadows? Even the Devil, who is here seen as a creature who walks by day and respects the sanctity of the church, holds little fear for the viewer.

Thanks to Brian Morris' production design and Michael Seresin's strategic lighting, the journey to self-knowledge is the film's most frightening revelation. △

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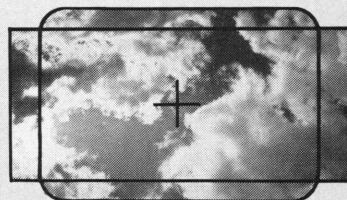
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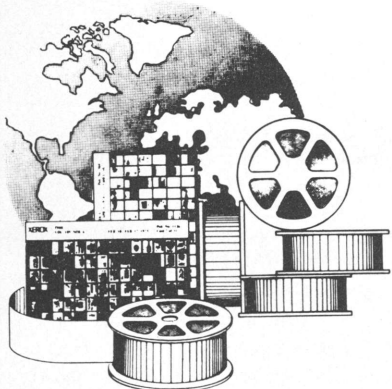
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From The Clubhouse

ASC members were busy during the second week in May as they entertained eight officers and members of the Chinese Society of Cinematographers visiting Hollywood from Taiwan. Led by Hwa Hwi-Yin, president of the Society, the Chinese delegation was entertained and toured for three full days of activity.

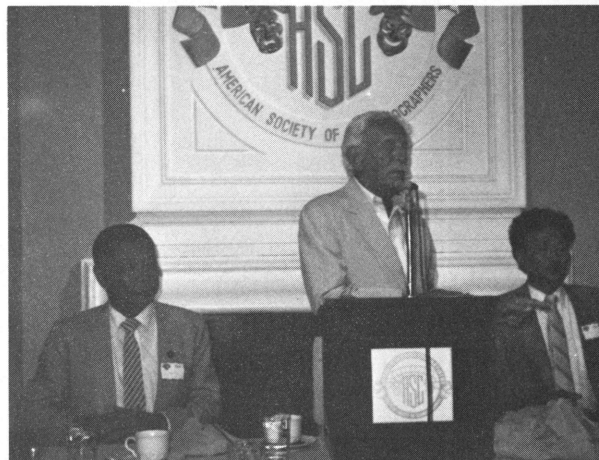
Included in the group of guests also were Jun Pun Locke, Chiang Chou, Hsi Le Chen, Lai Wen Shyung, Yuan Hong Wei, Lin Chi-Jung, and Lu Jun-Ming. T.P. Yang of Los Angeles acted as interpreter.

Bill Russell of Arriflex, Ed Carlin of KeyLite, Bud Stone from Deluxe Labs, John McDonough of Eastman Kodak, Dick Barlow of Warner Bros., Dan Ross of the Academy of Motion Picture Arts and Sciences, Doug Trumbull of Showscan, Harry Teitelbaum of Fuji Film and Frank Vogelsang of Panavision all played host for their various industry enterprises.

A special dinner, at which ASC board members were host, was held at the Clubhouse in honor of the guests. During the evening three award winning short subjects provided entertainment: a Laurel and Hardy comedy, "The Music Box," "Precious Images," and an animated work, "The Man Who Planted Trees."

Jim Branch and Nasir Zaidi of Spectra Cine demonstrated their new one degree spot meter, and Ed DiGiulio of Cinema Products, gave a presentation on 30fps versus 24fps, at a dinner meeting of the ASC membership on May 23.

The cinematographer's role in the production process, including camera, electrical and grip crew roles, film stock formats and lighting and metering techniques all were discussed in a two-day seminar titled "Breaking Into Production:



Above: ASC president Harry Wolf welcomes CSC members, including Hwa Hwi-Yin, chairman (left), and Yang Tuen-Ping, consultant. Left and below: CSC officers and members at clubhouse dinner.

the Cinematographer" recently at the American Film Institute in Los Angeles. Panel members from the ASC included Richard Edlund, Howard Schwartz, Michael Margulies and Vilmos Zsigmond. △

All Together, Now...Let's Bash!

Everybody loves the Biblical story of how a slender and bucolic youth, the future King David, fatally beamed the giant warrior, Goliath. It's also pleasant to contemplate those old adages which assure us that "a cat can look at a queen" and that "the pen is mightier than the sword." Taken altogether they illustrate facts enjoyed by those of us who are lucky enough to live in the more civilized parts of the world: that might doesn't necessarily make right, that everyone has a right to an opinion, and that those who are able to express their opinions to the public hold the key to great power. The power to topple giants.

Power demands responsibility; some persons can handle it and some can't. Abuse of power is a rampant fact of life, even in the aforementioned civilized places. Take, for example, the popular sport of bash-the-big-shot, which is practiced enthusiastically by some of the less responsible members of the press and electronic media. Hastily, lest we appear to be indulging a similar amusement, it should be noted that there are critics who bring intelligence and perception to their work. They are those who resist the temptation to sacrifice the efforts of others to personal whim, prejudice, the urge to turn a clever phrase, or a chance to take aim at a broad and vulnerable target. Praise be for these!

But there are others who, lacking creative ability of their own, find solace in tearing down the creations of others. At the same time, they become fixated upon certain "heroes" whom they praise out of all proportion, almost always at the expense of their less favored colleagues.

Take, for example, the eminent music critic who, in reviewing a return appearance by an elderly, revered pianist who had not concertized in many years, reported with undisguised glee that the old master had lost his touch. There was no hint of poignancy, sympathy or understanding, but there was an abundance of waspish, vicious elation that a musical idol had fallen to the ravages of time. Later, when his favorite conductor was forced to retire due to ill health, the writer was inconsolable.

Should this critic one day suffer a lessening of his abilities due to the erosion of old age, he will not have far to fall.



Film and television, being younger and more popular than the other arts and therefore having less venerable credentials, are especially vulnerable. Some shows are licked before they're shown, often because of prejudice against the genre, the star, the director, or even the publicist. It was *Time's* critic who, in the course of scourging *One Million Years B. C.*, synopsized the story as it was printed in the press kit, which only somewhat resembled what was shown on the screen. As the doctor should examine the patient before making his diagnosis, so should the critic see the movie before he presents an opinion.

Some time ago one of the better critics stated publicly that she so disliked Sylvester Stallone that she would never say anything good about any of his pictures. True to her vow, she has since lambasted each subsequent effort in turn. Whether or not they deserved it is beside our point, which is that pre-judgment invalidates criticism, pro or con.

Another consideration is the fad factor. For years it was fashionable to savage low budget pictures in general. Many of these "B" pictures have stood the test of time better than some of the acclaimed

"important" productions. Now the pendulum has reached the opposite extreme of "if it cost a lot, it must be awful."

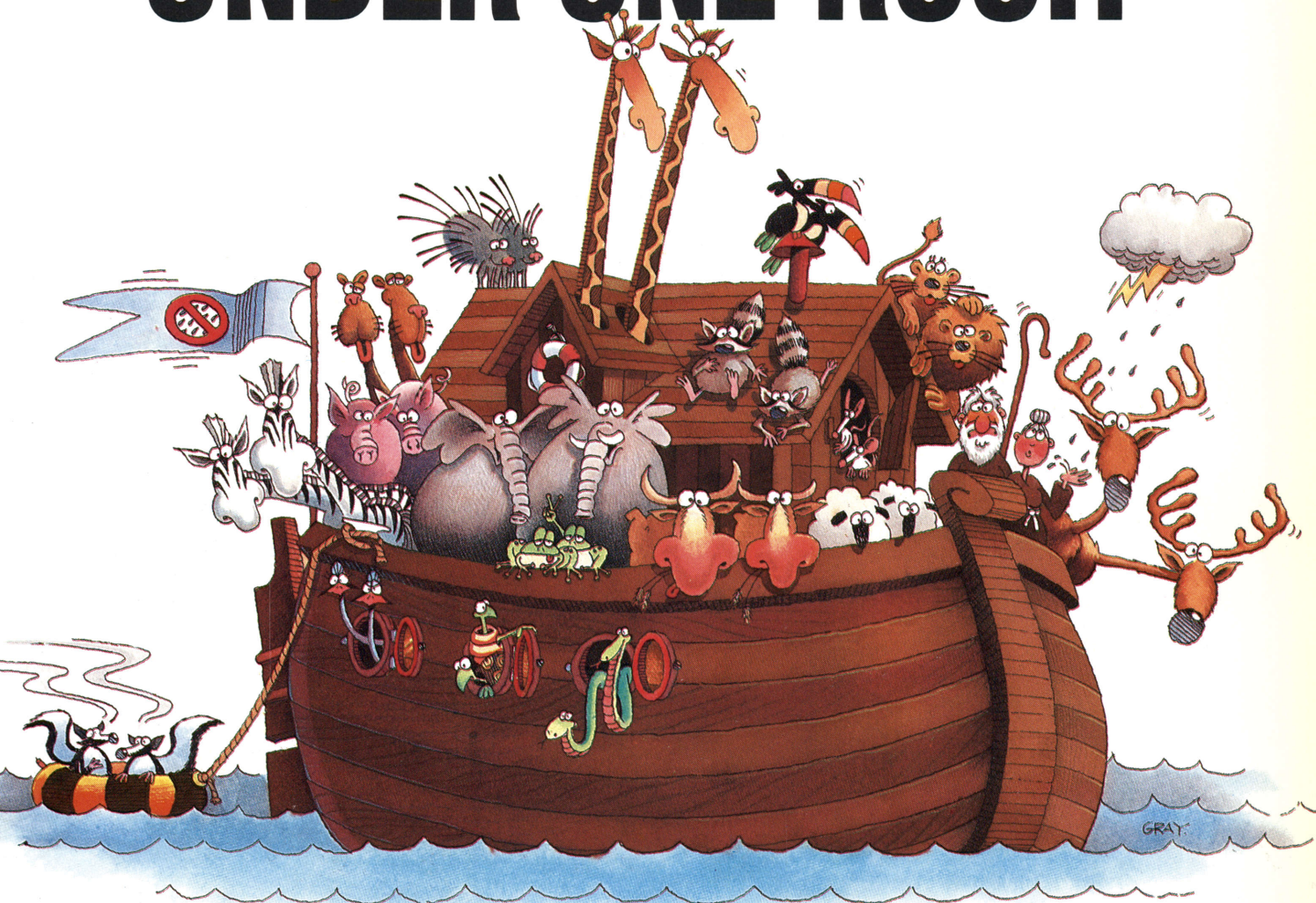
A favorite target for big-shot bashers these days is George Lucas. He's wealthy, he's independent, and – horrors! – he makes large-scale pictures that audiences love (except for an occasional miscue). Usually they exploit action, adventure, fantasy, exotic lands, mythology, and entertainment. Most can only be achieved through the utilization of highly sophisticated special visual effects. The current Lucas production, *Willow*, was greeted with a salvo of critical overkill such as *Newsweek's* David Ansen's reference to Lucas as "The great regurgitator of pop culture" and the Los Angeles *Herald-Examiner's* Peter Rainer's assessment of "Two hours worth of cliché-ridden scriptwriting and lackluster special effects."

As cartoonist Maratta recently noted in the Los Angeles *Times*, "For every action movie, there's an equal and opposite reaction by critics." The curious thing is that the same critics who despise pictures of the *Star Wars/Indiana Jones/Willow* school or a fast-action piece like *Lethal Weapon* are the same persons who occasionally bellyache because not enough pictures are sufficiently "cinematic." This is a term coined by critics to identify films that are true to the medium rather than being stultifyingly stagebound or literary in concept. Such pictures obviously can be done effectively only as motion pictures and necessarily utilize all of the artistic and technical resources of the medium.

Another name too popular to receive much critical approval is that of Steven Spielberg, and yet another is Walt Disney. Now that Disney, Spielberg and Lucasfilm's special effects facility have joined forces to produce an extravagant action/comedy, we may expect some truly colorful invective from critic's row. Or, perhaps, a fad will pass suddenly and the critical chorus will ring with praise that would embarrass a press agent. Who knows? Who cares?

—GT

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